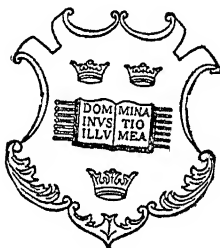


THE NEW OXFORD GEOGRAPHIES

By JASPER H. STEMBRIDGE

BOOK III NORTH AMERICA AND ASIA



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PREFACE

IN writing the *New Oxford Geographies* I have laid emphasis on the human side of Geography, and, in the words of the Spens Report, I have tried to give 'a conception of the world and its diverse environments and peoples, which should enable boys and girls to see social and political problems in a truer perspective, and give them sympathetic understanding of other peoples'.

When I was requested by a number of teachers to undertake this series I asked them to co-operate with me in its planning and preparation. I owe more than I can say to their valuable suggestions and constructive criticisms. Particularly is this the case as regards the general scheme, which aims at providing a *graded* course for pupils in Secondary Schools who are working for the School Certificate and similar examinations. I have dealt with basic geographical principles as they have arisen in connexion with the various regions.

A study of the Geography syllabuses of some hundred and fifty schools showed that while almost all of them were based on the principles laid down in the Spens Report, there was a considerable divergence in detail. That, I think, was all to the good, but it does not lighten the work of an author, and to suit the curricula of different schools there are alternative arrangements of the continents.

Throughout the series I have tried to avoid over-generalization. I have used as often as possible concrete and detailed descriptions of places and scenes to exemplify and illustrate the way in which Man's life is conditioned by his environment, and how his activities are influenced by the seasonal rhythm.

In all the books maps and photographs are closely linked with the text. The maps are simple. They are designed to bring out salient facts and are intended to supplement, but not to replace, the maps in a good atlas. Each photograph has been selected for its geographical interest, and both in the underlines and in the text attention is drawn to the important features.

The exercises are intended to encourage the pupils to master the text, and also to make intelligent use of the maps and photographs, and of the indexes.

I may be excused for inviting special attention to the Index. Every student knows the value of an index as giving in detail the contents of the book, as making reference easy, and as bringing together the several places in which the same or cognate matters are discussed. Every progressive teacher knows the usefulness of an index in training pupils in the practice of finding out things for themselves. It is my earnest hope that the Index to each book will be found satisfactory to both teacher and pupil.

I should like to express my thanks for reading the proofs and for their criticisms to Mr. G. H. Ely, Mr. J. Myers; to my former colleague on the Board of Education Geography Panel, Mr. J. W. Page; and to Mr. A. L. P. Norrington of the Oxford University Press.

J. H. S.

OXFORD
August 1941

NOTE

In this series Book II deals with the Southern Continents—South America, Africa, and Australia, in that order; Book III with North America and Asia. The matter contained in these two books is also obtainable in a different arrangement. Section 2 contains South America and North America, Section 3 Africa, Australia, and Asia. As this is a graded course South America is naturally treated on simpler lines than North America. Therefore, in the alternative arrangement, South America precedes North America, and, similarly, Africa and Australia precede Asia.

Each of the Continents is also obtainable separately.

In normal times each book in this series is, if necessary, revised and brought up to date when reprinted. But the speed of developments during the war, and the inaccessibility of many facts for reasons of security, make proper revision under present conditions impossible, and this war-time reprint is therefore unchanged. It is hoped to issue corrected and up-to-date editions as soon after the war as possible.

J. H. S.

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NORTH AMERICA

CHAPTER I

PEOPLES OF NORTH AMERICA

The Coming of the Europeans

It is only during the last century that the greater part of North America has been opened up. Five hundred years ago the continent was almost unknown to Europeans; two hundred years ago it had fewer white inhabitants than London has to-day; now its people of white descent exceed 150 millions.

As early as A.D. 986 adventurous Norsemen from Scandinavia visited the shores of Greenland and explored the coasts of North America as far south as the mouth of the Hudson. But their exploits were forgotten, and the real history of North America begins in 1492 when Columbus, seeking a seaway from Europe to India, landed at Watling Island, in the Bahamas. But he did not realize that he had reached a new continent, and it was left to Amerigo Vespucci (1451-1512) to give his name to America. In 1497-8 John Cabot, an Italian sea captain in the service of Henry VII of England, visited Newfoundland and Hudson Strait; and Francis Drake, in the course of his three-years' voyage round the world, landed on the Pacific coast of North America. The wealth of the New World attracted adventurers from all the maritime countries of Western Europe, and for several hundred years there was fierce rivalry between England, France, and Spain for the dominant position in the newly discovered continent.

The Indians

When Columbus reached the New World he found that it was inhabited by a copper-coloured people, with straight black hair, high cheek-bones, and long, well-shaped noses.

As he thought he had arrived in India, he called the people *Indios*, a name which has persisted, for we still speak of the native inhabitants of the Americas as Indians. Like the

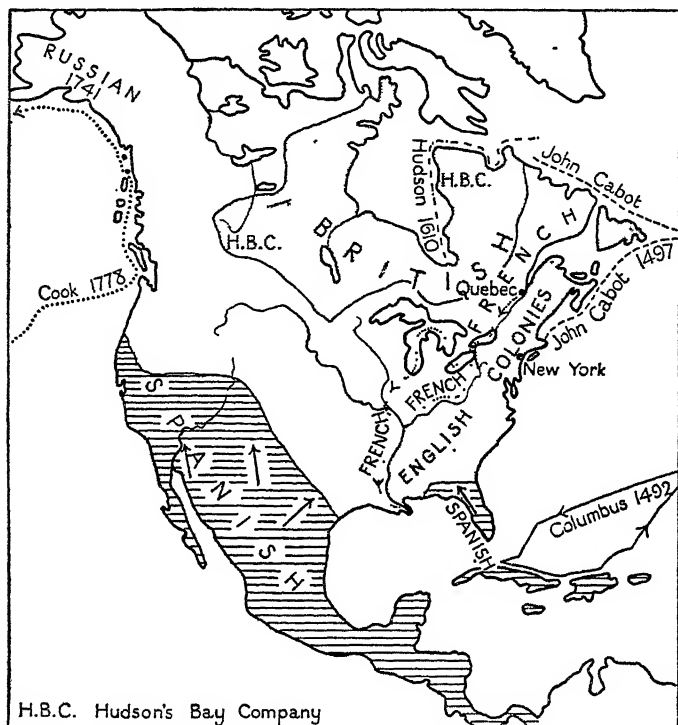


FIG. 1. Exploration of North America

Eskimos, the Indians were probably of Mongolian origin, but if so they must have migrated to America many centuries before the coming of the Europeans.

The Indians were spread throughout both continents, but their numbers were relatively small, and it is estimated that in what are now Canada and the United States they did not exceed 5 millions. There were many tribes speaking different languages. They had reached various stages of

culture and the levels attained were largely the result of their environment. A few, such as the Californian tribes, had scarcely emerged from the collecting stage. Many were merely primitive hunters and fishers, but others were farmers, and some, such as the Mayas of Yucatan and the Aztecs of Mexico, had attained a high degree of civilization.

The desolate Arctic coast-lands were inhabited by Eskimos, hunters of seal and caribou. To the south the lightly timbered belt, which gradually merged into the cold forests, was the home of the Indians who, like their Eskimo neighbours, hunted caribou. These animals provided them with meat and skins for clothing, and for covering tepees, in which openings were left at the top to allow the smoke to escape from the brushwood fires beneath. Among these Indians of the Far North those living in the Coppermine district, north-east of Great Bear Lake, fashioned knives and other weapons from copper which they dug up in lumps. Some of these they bartered with the tribes round the Great Slave Lake, who became known as the Yellowknife Indians, on account of their yellow (copper) knives.

Along the forested fiorded coast of British Columbia and Alaska dwelt tribes, such as the Tlinkits, who depended mainly on salmon, halibut, clams, mussels, wildfowl, and the eggs of aquatic birds. Of these items in the bill of fare salmon was the chief, for besides providing food in summer it was smoked and dried to replenish the winter larder. The people lived in villages which, as in the case of other hunting and fishing groups, were of necessity small, for no settlement could be larger than the game resources of the surrounding area would permit. Timber was used for building communal houses, often called rancheries; for making dug-out canoes, which were hollowed from the trunks of cedar trees; and for totem poles on which were carved scenes depicting events in tribal history. And

besides being woodcarvers, these Indians were expert workers in stone and copper.

In the great forest belt stretching from the Atlantic along the St. Lawrence and the Great Lakes lived the Iroquois, Hurons, and other hunting and fishing tribes. They also practised simple agriculture, growing maize, beans, and tobacco, and harvesting swamp rice as do some of their descendants in this region to-day. They dressed in skins, lived in wooden houses in winter, when they used sledges for transport and wore snow-shoes that enabled them to move easily over the snow-mantled ground. In summer they made their homes in tepees, often covered with strips of birch bark. These conical tents were easily packed up and carried in their canoes, in which they travelled long distances, making portages from one stream, or lake, to another. "Their canoes (unlike the dug-outs of British Columbia) were made of ribs of cedar bent to the proper shape and covered with sheets of birch bark. The joints were sewn together with threads obtained from the spruce tree, and the cracks were filled in with a kind of pitch."¹

Plains Indians, such as the Cheyenne and Dakotas, roamed over the prairies hunting buffalo (bison), and, like their kinsfolk in the Far North, lived in skin-covered tepees, which lent mobility to their migrations.

It is interesting to note the manner in which the Indians living in the hot, dry regions of the west and south-west adapted their mode of living to an environment that was very different from that of the Plains Indians. As there were no buffaloes and comparatively little game, they turned their attention to agriculture, cultivating maize, tobacco, tomatoes, and other vegetables. No skins being available, they wove hair and vegetable fibres to make clothes. They were also potters and metalworkers. Depending almost entirely for their existence on agriculture, their methods were more advanced than those of the Iroquois, who relied

¹ Masson, *Bourgeois de la Compagnie du Nord-ouest*.



1. INDIAN HOMES—TEPEES AND PUEBLOS

(Above) The tepees of these Stoney Indians, seen at Banff, Alberta, are constructed on traditional lines, though they are covered with canvas, instead of the skins used in those days when the tribes hunted bison on the prairies. Just as well suited to the agricultural Pueblo Indians are the adobe and stone dwellings of the village pictured (below) in Arizona (see pp. 5 and 130).



2. CONTRASTS IN THE CORDILLERAS

(Above) The Athabasca Glacier descending from the Columbia Ice-Field, remnant of the last Ice Age, and greatest body of ice in North America outside the Arctic. The glacier feeds the Sunwapta, head-waters of the Athabasca River, seen flowing in its boulder-strewn valley. The Banff-Jasper Highway (left) runs close to the snout of the glacier. In striking contrast is the Colorado Plateau (below), where the Colorado River has cut its mighty canyon through the horizontal strata. The Boulder Dam is seen in the middle foreground (see pp. 128 and 129).

on hunting as much as, or even more than, on crops. Hence they were able to make a small area support a fairly large population. Being agriculturalists they lived a settled life, and their villages were larger than those in the North, especially in Mexico where there were large towns, or even cities. Some of the tribes in Colorado, Arizona, and New Mexico dwelt in caves, either natural or hollowed out of the soft sandstone cliffs of the canyons. Others constructed great communal houses of stone or adobe, which the Spaniards called *pueblos*, a word meaning a town (see Plate I).

At first the Indians received the white men kindly, but when the invaders began to dispossess them of their lands strife commenced between the two races. Unable to cope with the superior weapons of the Europeans the Indians were driven from their hunting-grounds and villages. As time went on their numbers diminished, but they have increased somewhat in recent times, owing to the enlightened policies adopted by the Governments of Canada and the United States. In both countries large reserves have been set aside for the Indians on which they can lead a tribal life, following their traditional occupations. Some live in tepees, or in ordinary tents, but the majority dwell in wooden houses, and some of the wealthier ones own motor-cars. Much is being done to educate the Indians and to improve their health and general well-being.

Colonization

It was not until a century after the time of Columbus that Europeans began to colonize North America. Coming across the Atlantic they entered the continent from its eastern seaboard: the French through the St. Lawrence; the English up the estuaries to the south; and the Spaniards by the Gulf of Mexico. Overthrowing the Aztec civilization, the Spaniards founded their Mexican Empire, which extended from Mexico north-west into California. Pushing

west from the St. Lawrence the French established a vast domain around the Great Lakes. Subsequently they descended the Mississippi, claiming all the lands from the Ohio southward to the Gulf of Mexico for King Louis of France, under the name Louisiana.

The British, basing their rights on the discoveries of Cabot, Drake, and others, claimed all of North America not occupied by Spain. The development of the vast territory stretching from Labrador, through the Hudson Bay region, to the Pacific was undertaken by the Hudson's Bay Company, founded in 1670. Of more immediate importance than these rather shadowy claims of the British were their settlements along the coastal plain, lying between the Appalachians and the Atlantic. The Dutch, however, established trading posts at the mouth of the Hudson and pushed northward up the valley. But they were soon dispossessed by the English, who on capturing their chief settlement, New Amsterdam, renamed it New York.

Meanwhile, British colonists made their way through the Appalachian valleys to the fertile plains of the Mississippi, where they came into conflict with the French settlers. The latter not only failed to restrict British expansion in this region, but ultimately lost Canada, which they surrendered to their rivals a year after Wolfe's victory at Quebec in 1759.

But the tide of Empire ebbed and flowed, and though for a time the colonies along the Atlantic seaboard remained under British rule, they revolted in 1776 and, proclaiming themselves independent of the Mother Country, became the nucleus of the United States.

To-day the only French possessions in North America are two small island groups off Newfoundland, and Martinique and Guadeloupe in the West Indies. But the people of Quebec, the Canadian province lying along the St. Lawrence estuary, still preserve the traditions of France and speak the language of their former Motherland.

Likewise, though Spain no longer holds territory in North

America, yet in Mexico, Central America, and the West Indies her influence persists. Apart from Indians and negroes, who are found mainly in Jamaica and Hispaniola, the majority of the people in this southern part of the continent are of pure or mixed Spanish descent. Spanish is the language of the majority of the white inhabitants of this region; and many buildings are constructed in Spanish style, a type of architecture well suited to a climate which resembles somewhat that of Spain.

The Russians crossed the Bering Strait and penetrated into Alaska, which they leased to the Hudson's Bay Company. In 1867 this region was purchased by the United States.

Modern Developments

Before the days of the steamship and the telegraph cable, not to mention later inventions such as wireless, North America was relatively isolated from Europe, and for a time the growth of European settlement was slow. In many ways this was an advantage. Only determined and sturdy pioneers were willing to cross the broad Atlantic and face the hardships overseas and perils of the unknown. The colonists were men of every type and every class. Some came from old landed families. Some sprang from professional stock. Some were yeoman farmers. Many sought refuge from religious persecution. But nearly all were men and women of grit, filled with a spirit of high adventure, who wished to find in the New World freedom and opportunities denied them at home.

The wave of emigration reached its height in the years before the Great War of 1914-18. Since then it has receded, largely owing to restrictions imposed by the United States. But during the nineteenth century the growth in the population of North America was enormous. Emigrants from all European countries have settled in the continent, especially in Canada and the United States where, with English as

their common tongue, two great democracies live on either side of an undefended frontier. In both countries a number of Japanese and Chinese are found along the Pacific coast. In the south of the United States live some 12 million negroes, who, like those in the West Indies, are descendants of former slaves brought from Africa to work on American plantations.

The Statue of Liberty at the entrance to New York harbour is a symbol of that freedom which is cherished throughout America as one of the fundamental Rights of Man. Remote from the dissensions that distract Europe, but by no means unaffected by them, the people of the United States can look back on 150 years of peaceful progress, broken only by the Civil War (1862-5) which ultimately bound them more closely together.

Through the efforts of the original European settlers and their successors, the vast prairies have been sown with grain and stocked with flocks and herds; the timber and mineral wealth developed; the falls harnessed for power; and these and other resources utilized for industry, commerce, and the general well-being of mankind. The world is on the eve of changes the effect of which cannot be foreseen, but there is no doubt that great as was the progress of North America in the last century, her future progress will be greater still.

EXERCISES

1. (a) Give an account of the Indians living in North America at the time it was first settled by Europeans, and show how their lives were influenced by their environment. (b) What peoples, other than Indians, Eskimos, and those of European descent, are now found in North America? Account for their location in the areas in which they live.

2. (a) In what parts of North America were the first English and French settlements made? (b) Show how the expansion of these two peoples was influenced by the relief of the continent.

3. What European nation, in addition to the English and French, colonized much of North America? In what ways did this nation influence life in this continent?

CHAPTER II

NORTH AMERICA: POSITION, SIZE, AND
PHYSICAL FEATURES**Position and Size**

NORTH AMERICA and Eurasia, the two great land masses of the Northern Hemisphere, are washed by the same three oceans—the Arctic, Atlantic, and Pacific. Only a globe shows the true position and size of these regions, and if we examine one it will be clearly seen that North America and Eurasia almost encircle the Arctic Ocean. Compare the relative positions of Moscow and San Francisco on a map and on a globe. The globe shows that the most direct route between the two cities is that passing over the polar regions which, except for certain minor deviations, was followed by Russian airmen in their flight from Russia to California in 1937. In the future this route may become one of commercial importance. Across the North Atlantic the east coast of North America faces Europe, some 2,000 miles distant; while across the North Pacific the western seaboard of North America looks towards Asia, from which it is separated by only 100 miles across the Bering Strait. Hence North America, facing the world's two principal oceans, and its two most densely peopled continents, is exceptionally well placed for trade, and its natural advantages were increased by the construction of the Panama Canal linking the Atlantic and the Pacific.

North America has a much less indented coast-line than Europe, but is not so compact as either South America or Asia. Chief among its larger openings are Hudson Bay, which provides a sea-route from the Canadian prairies for a few months in summer; the St. Lawrence, which, with the Great Lakes, is the most important inland waterway in the world; the Gulf of Mexico, a link with South America; and

the long narrow arm of the Gulf of California, which is of no great importance, running in from the Pacific.



FIG. 2. North America: Physical Divisions

If we look at the map of North America we shall see that from the St. Lawrence southward to Chesapeake Bay the coast of the United States is much indented. It is a sunken area, where the lower parts of the valleys have become flooded by the sea, forming deep inlets—*rias*—at, or near,

the heads of which important ports stand. On the western side of the continent, in Alaska and British Columbia, the sunken coast is indented by fiords which resemble those of Southern Chile. But south of Puget Sound the Pacific coast is rising. It has few openings and is backed by fold mountains which bar the way to the interior. Thus, on account of the lack of good harbours and difficulties of communication inland, there are few large ports along this part of the western seaboard. The type of coast-line affects the development of a region. As a general rule, indented coasts are sinking; long straight coasts are rising. Indented coasts, of course, are more favourable to the progress of a region.

With an area of 8 million square miles, North America is rather bigger than South America, about twice as large as Europe, and slightly less than half the size of Asia. The mainland extends from 70° N. to 10° N., or about 4,200 miles ($1^{\circ} = 70$ miles approximately), while the meridian of longitude 100° W. almost bisects it. As the continent is roughly triangular in shape, tapering to the south, the bulk lies in the north temperate zone; only a small portion within the tropics; and the area north of the Arctic Circle is of no great extent.

Physical Features

There are four well-marked physical divisions in North America. They are: (1) the Western Cordilleras or Rocky Mountain System; (2) the Appalachians; (3) the Canadian Shield, in the north; and (4) the Central Plains.

1. *The Western Cordilleras*, which extend from Alaska southward for about 4,300 miles into Central America, vary in width from 400 to 1,100 miles. Like their continuation the Andes of South America, or the Himalayas, they are young fold mountains. On account of crustal weakness they contain a number of active and extinct volcanoes, and are subject to earthquakes, such as that which in 1906 partly destroyed San Francisco. Broadly speaking,

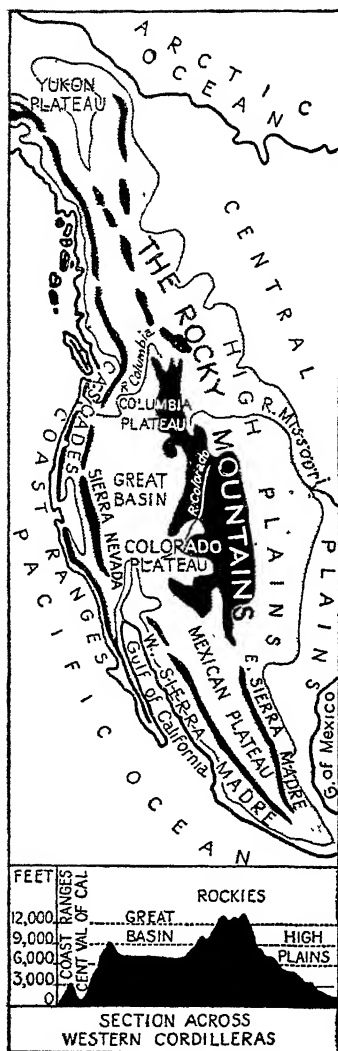


FIG. 3. The Rockies

the Cordilleras comprise three main chains separated by depressions. The system consists of (a) Coast Ranges, separated by (b) longitudinal valleys from (c) the Western Chain, which in its turn is separated by (d) high plateaux from (e) the main chain of the Rocky Mountains (see Fig. 3).

(a) *The Coast Ranges* run from Alaska to the Peninsula of California. In southern Alaska and British Columbia, owing to the sinking of the coast-line, the ranges are submerged, except where higher portions remain as islands, such as Vancouver Island.

(b) *The Longitudinal Valleys.* To the east of the Coast Ranges lie a series of valleys. In British Columbia, on account of the submergence of the coast-line, the valleys are 'drowned', and are represented by a series of straits, which run between the mountainous island-fringe and the equally steep mountain wall of the continent. The chief of these straits is the Strait of Georgia between Vancouver Island and the mainland of British Columbia. This strait is continued south by Puget

Sound, from which the depression may be traced through the Great Pacific Valley, and the Central Valley of California, south of which it is again submerged, forming the Gulf of California.

(c) *The Western Chain.* To the east of the depressions rises the Western Chain, which is known by various names. In the north the Alaskan Ranges, whose snow-capped peaks tower to over 18,000 feet, contain many snow-fields and glaciers. Farther south the Cascade Range extends from British Columbia into California, where it is continued east of the Central Valley by the Sierra Nevada; and in Mexico by the Sierra Madre.

(d) *The Intermont Plateaux.* The high plateaux, lying between the ranges of the Western Chain and the Rocky Mountains, include the Yukon Plateau; the Columbia Plateau, crossed by the Snake River, a tributary of the Columbia; the Great Basin of Inland Drainage around the Great Salt Lake; the Colorado Plateau; and the Mexican Plateau, between the Western Sierra Madre and the Eastern Sierra Madre, the latter forming one of the ranges in the Rocky Mountains.

(e) *The Rocky Mountains.* East of the plateaux rise the Rocky Mountains proper, whose lofty peaks, dominating every landscape, include the volcanoes of Popocatepetl and Orizaba, which raise their snow-clad cones high above the Mexican Plateau (see Plate II).

2. *The Appalachians* run southward from the St. Lawrence for some 1,300 miles parallel to the Atlantic coast. But though neither so lofty nor so broad as the Western Cordilleras they are of far older formation; and like the Eastern Highlands of South America are residual mountains. The Appalachians are the remains of ancient fold mountains that were worn down by prolonged denudation, covered up by later deposits, again raised, and then weathered into their present ridges and valleys. North of the Hudson Valley the Appalachians form the New England

Ranges. South of the Hudson Valley they consist of the parallel ridges and valleys known as the Central and Southern Appalachians. On their seaward side the Southern Appalachians sink to the Piedmont Plateau which drops steeply to the Atlantic coastal plain. Over the scarped face of the Plateau rivers descend by falls to the lowland. The *Fall Line* so formed is important. The base of the scarp, in the days when ships were small, marked the head of navigation on the rivers, and so became a site for towns. To-day the falls are used to generate hydro-electric power.

3. *The Canadian Shield.* Lying around Hudson Bay and stretching southward towards the Great Lakes is an area composed of some of the oldest-known rocks (Pre-Cambrian) in the world. The highest part forms the Labrador Highlands, but in the course of ages the whole region has been so worn down that it has been re-

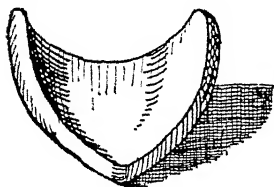


FIG. 4

duced to the condition of a peneplain.¹ As this part of Canada resembles a shield lying on its front it is known as the Canadian Shield. Its hard crystalline rocks are rich in minerals, especially nickel, copper, and gold. The bedrock stands out as low ridges above the thin, infertile soil. Many of the valleys and hollows have been dammed up by debris to form lakes linked by swift streams, whose waters are harnessed for power. Ice was the chief tool that Nature used in wearing away this region. On the west and south the Shield merges into the Central Plains.

4. *The Central Plains*, which stretch from the Arctic Ocean to the Gulf of Mexico, cover about three-fifths of North America. They are a shallow downfold (or syncline) lying between the Western Cordilleras and the older Appalachians. The plains are floored with sedimentary rocks, laid down on the bed of a shallow sea, and subsequently

¹ *pene* = almost.

raised. They may be divided into (i) the Northern Lowlands drained to the Arctic and Hudson Bay, which include part of the Canadian Shield; (ii) the St. Lawrence-Great Lakes Lowlands; (iii) the Central Lowlands of the Mississippi; (iv) the Gulf Lowlands; and (v) the High Plains, lying at the foot of the Rockies, which have an average elevation of 3,000 feet. The whole region is remarkably level, and the different sections merge into one another without much perceptible change of slope. It is possible to travel from the shores of the Arctic to those of the Gulf of Mexico without crossing any land more than 1,000 feet above sea-level.

The Ice Sheets

The Earth's surface is continually changing. Mountain-building movements result in the formation of fold ranges, but no sooner is a part of the crust uplifted than it begins to weather. Heat and cold, rain, wind, running water, ice, and chemical processes which disintegrate rocks, are ever at work moulding the land. In past ages ice was one of the greatest of these agents of denudation. At the present time, in the form of ice sheets or glaciers, it is confined to relatively small areas, but even now most of Greenland is buried beneath the Ice Cap.

During the glacial periods great ice sheets crept slowly southward across North America as far as the present valleys of the Missouri and Ohio. So thick were these sheets that they covered not only plains but mountains, leaving the higher parts alone standing as islands above a vast frozen sea. They ground away the surfaces over which they passed and scooped out great basins. The ice sheets also transported great boulders and blocks of rock for considerable distances, and when they melted deposited them in regions quite different from their original homes. Boulders of this type, called *erratics*, or 'wanderers', are found in many areas once covered by the ice sheets. There are, for instance, numbers on the prairies.

There were several glacial periods between which the climate was milder. When the ice sheet finally began to melt and disappear it deposited debris over the lower ground.

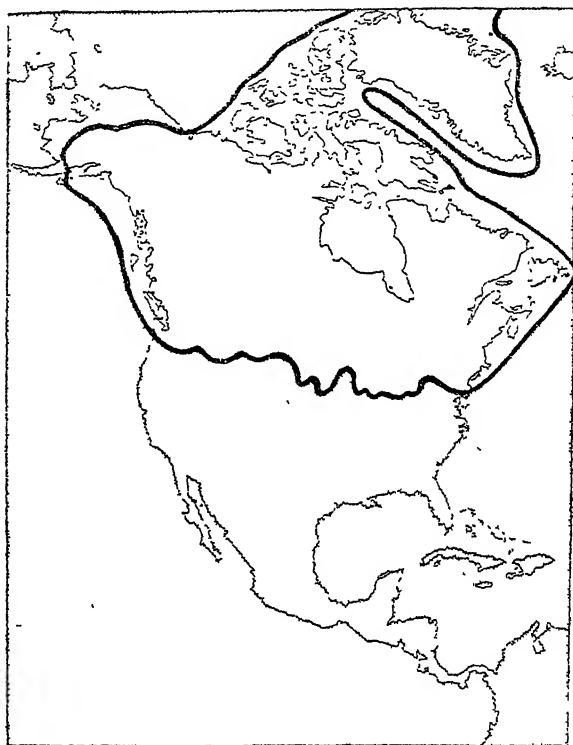


FIG. 5. North America: Extent of the ice sheet during the Glacial period

This glacial drift sometimes formed rounded hills, or spread out as sheets of boulder clay which to-day, in many parts of North America, forms fertile, if often stony, farming land. As a result of the passage of the ice sheet the surface of the land was left in such an uneven condition that much of the water was unable to find its way to the sea. Hence it col-

lected in hollows, forming lakes of all shapes and sizes, often linked by short streams flowing over rapids and falls.

Towards the close of the Ice Age the Great Lakes gradually became free, though their outlet through the present St. Lawrence valley continued to be blocked with ice. Thus for a time the lakes drained southward to the Mississippi. Later their waters poured through the Mohawk Gap into the Hudson, whose glacier-formed valley is now such an important route. It was not until the Ice Age had passed that the Great Lakes were able to discharge their waters, through what is now the St. Lawrence, into the Atlantic.

Rivers and Lakes

The waterways of North America, spreading like a net across the continent, include some of the longest rivers and largest lakes in the world. But, as in other regions, the importance of the rivers does not depend mainly on their length or volume, nor does that of the lakes depend on their size. Their value to Man lies in the productiveness of the areas they serve, the direction in which they flow, and whether their waters can be used for irrigation and power.

Rivers flowing into the Arctic and Hudson Bay. Chief of the rivers flowing into the Arctic is the Mackenzie, 2,500 miles long. Rising as the Athabasca (see Plate 2), in the Rockies, it enters Lake Athabasca, flows through the Great Slave, receives the drainage of the Great Bear Lake, and passes into the Arctic Ocean through a huge delta. But this waterway is only navigable for a few months in summer as it is frozen for the rest of the year. The North and South Saskatchewan, flowing in trough-like valleys across the prairies, unite before entering Lake Winnipeg, which is drained by the Nelson to Hudson Bay.

Atlantic Rivers. By the St. Lawrence and the Great Lakes it is possible to travel from the Atlantic for 2,400 miles into the heart of North America. Other streams entering the

Atlantic are valuable chiefly because, like the Hudson, their valleys are important routes; or because, like the rivers descending from the Central Appalachians, they form falls which provide power.

Gulf Drainage. The principal river in North America is the Mississippi (2,500 miles), whose basin covers one-third

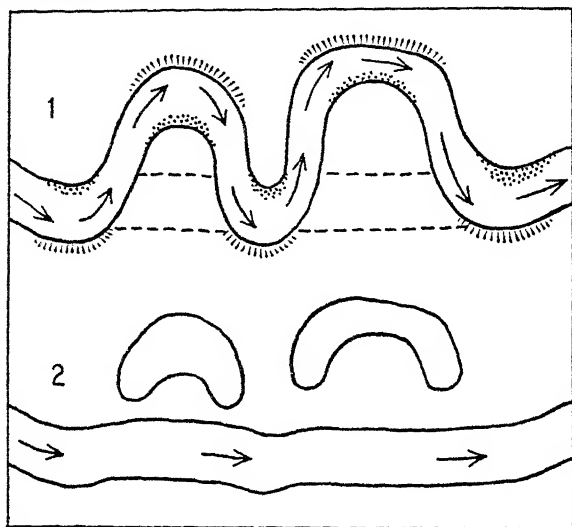


FIG. 6. Formation of ox-bow lakes

of the United States. Rising in Lake Itasca to the west of Lake Superior, it flows for about 400 miles through many small lakes and over numerous falls, of which the last and greatest are the Falls of St. Anthony, below which the river is navigable for small vessels as far as the Gulf of Mexico. At St. Louis the Mississippi receives the Missouri (2,450 miles) from the Rockies, whose chief feeders are the Yellowstone, Platte, and Kansas. Below St. Louis the principal tributaries are the Ohio, which rises in the Appalachians, and the Arkansas and the Red River whose sources are in the Rockies.

In the lower part of its course the Mississippi winds slowly over the plain and deposits much sediment on its bed. So great is the amount that has been dropped that the river actually flows at a higher level than the surrounding land, which is protected from inundation by earth embankments, called *levées*. Owing to the enormous amount of sediment it carries the Mississippi has also pushed its delta far out into the Gulf of Mexico.

Swinging in great bends across the lowland the Mississippi cuts first into one bank and then into the other, so cutting bluffs. In time the bends approach each other and during the floods the river cuts across the intervening land, hollowing out a fresh channel and thus shortening its course. Part of the former bend is often left as a lake which on account of its shape is termed an *ox-bow lake* (Fig. 6 (2)).

The lower Mississippi and its tributaries, notably the Ohio, are subject to great floods whose effects are the more calamitous because of the absence of lakes to act as temporary reservoirs. The floods that occur in winter are due to heavy rain in the north-west Appalachians. Those in May are caused by snows melting in the plains, and those in June by the melting snows on the mountains and High Plains at their base. But though they do incalculable damage, the floods spread alluvium over the land and so increase its fertility.

The Rio Grande (2,000 miles) is the only other really long river flowing into the Gulf of Mexico.

Pacific Drainage. Despite its length, the Yukon (2,000 miles) is relatively unimportant, as it is frozen for eight months in the year, and flows through a sparsely peopled district. Farther south are the Skeena and the Fraser, whose valleys are followed by trans-continental railways; the Columbia (1,400 miles) and its tributary the Snake (1,000 miles); and the Colorado, whose famous canyon forms a barrier to communication, but whose waters have recently been harnessed for irrigation and power.

EXERCISES

1. Illustrating your answers by diagrams, and giving one example of each from North America, explain briefly how fold mountains, residual mountains, and peneplains are formed.
2. Describe *three* ways in which the work of ice during the glacial periods affects the lives of people now living in North America.
3. (a) What do you understand by the word *cordillera*? Why is the Rocky Mountain System usually known as the Western Cordilleras? (b) Why are mountains of this type subject to earthquakes and volcanic activity?
4. The Mississippi frequently changes its course. What is the reason for this? Illustrate your answer by diagrams.

CHAPTER III

THE CLIMATE OF NORTH AMERICA

Outstanding Factors

In a small area such as the British Isles the climate does not vary greatly between one part of the country and another, but in a vast region like North America there are a number of types of climate. Let us note some of the chief factors affecting the climate of this continent.

1. As North America stretches from the Arctic regions to the Tropics there is a considerable difference between the temperature of the north and south.

2. The Western Cordilleras, and to a lesser extent the Appalachians, prevent moderating influences from the Pacific and Atlantic Oceans respectively from reaching the interior, which has a continental climate with great extremes of heat and cold.

3. The absence of a mountain barrier on the north allows cold winds from the Arctic Ocean to travel far inland; while lack of a similar highland barrier on the south permits warm southerly winds to blow up the Lower Mississippi valley.

4. The Great Lakes moderate the temperature and increase the rainfall in the surrounding area. For instance, in the Lake Peninsula spring comes earlier and autumn later than farther east in the St. Lawrence Valley.

Temperature

In *winter* the great land mass of North America cools rapidly while the surrounding oceans still retain much of the warmth they have been gathering during summer. Temperatures increase from north to south and isotherms run from west to east. But as the interior of the continent is much colder than the coastal regions the isotherms bend south over the land. The January temperature map (Fig. 7)

shows that the west coast is warmer than the east, for the prevailing south-west winds blowing from the Pacific raise its temperature. As these winds flow across the continent they become colder, and as they blow off-shore along

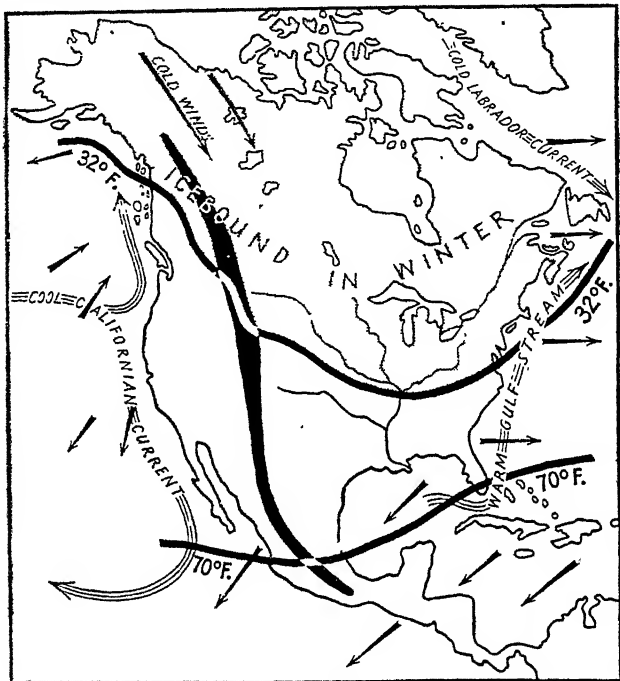


FIG. 7. North America: January Temperature

the East coast they reduce the temperature. The January temperature of Victoria, on the west coast of British Columbia, is 39° F., but that of Halifax, in almost the same latitude on the east coast, is only 24° F. Even in winter the Great Lakes, though frozen round their shores, have a moderating effect on temperature.

Note also the effect of the ocean currents. The cold Labrador Current, flowing along the north-east coast of Canada, lowers the winter temperature of this region. On

the other hand the warm Gulf Stream increases temperatures along the south-east coast of the United States. Along the Pacific seaboard the cool Californian Current reduces the temperatures of the coastal regions.

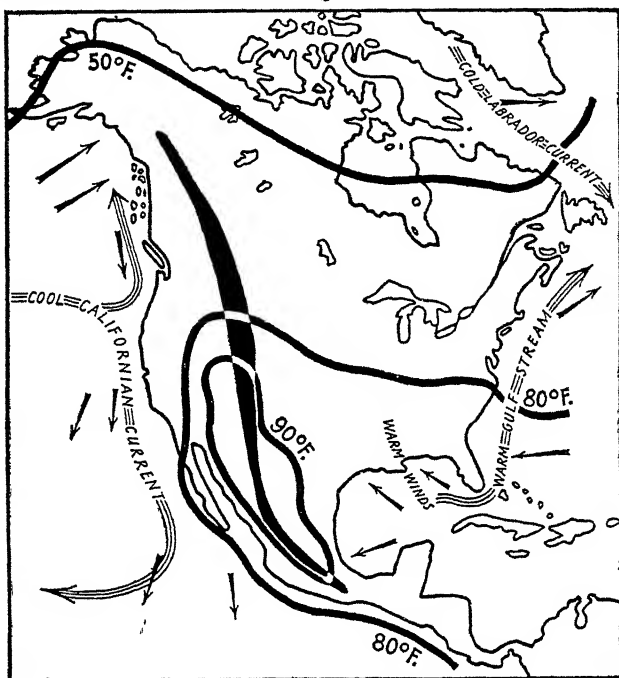


FIG. 8. North America: July Temperature

In *summer* the interior of the continent gains heat even more rapidly than would otherwise be the case owing to the mountain barriers on the west and east. The ocean is now relatively cool and so the coastal regions are cooler than the interior. The isotherms still run from west to east, but now they bend north over the land and south over the sea. In the north of the continent, the west coast, exposed to the on-shore westerlies, is now cooler than the east, where warm south-west winds blow off-shore from

the heated land. In summer the Great Lakes exert a cooling influence on the surrounding area. The south of the continent, as well as the West Indies, has a July temperature of over 80° F.; while in the south-west the temperature of the interior exceeds 90° F.

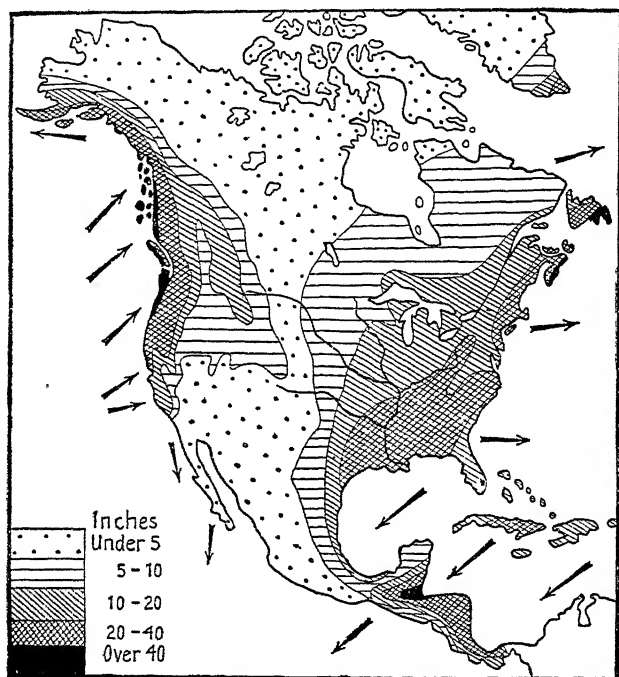


FIG. 9. North America: Winter Rainfall and Winds

Winds and Rain

As the northern part of North America lies in the westerly wind belt there is over this portion of the continent a general movement of air from west to east. Along the Pacific coasts of Alaska, British Columbia, and the adjacent areas in the United States the south-westerly winds blow on-shore throughout the year bringing rain at all seasons,

but especially in winter. British Columbia has an oceanic climate very like that of Ireland or the south-west of England. The windward slopes of the Rockies receive much moisture in the form of either rain or snow. But the sheltered valleys, lying between the ranges, are dry and

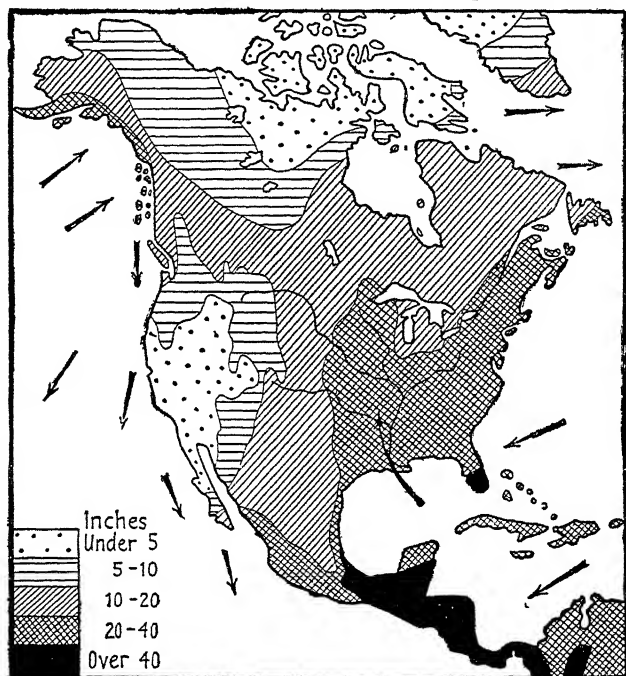


FIG. 10. North America: Summer Rainfall and Winds

depend for their moisture on streams descending from the mountains which provide water for irrigation. The leeward slopes of the Rockies receive relatively little rain as they lie in the *rain shadow* of the mountains. The prairies receive most of their rain in spring and early summer.

We know that the heat, wind, and rainfall belts move north and south with the apparent movements of the Sun. During the northern winter, when these belts swing towards

the south, Central California comes under the influence of the westerly winds which blow on-shore bringing rain. But

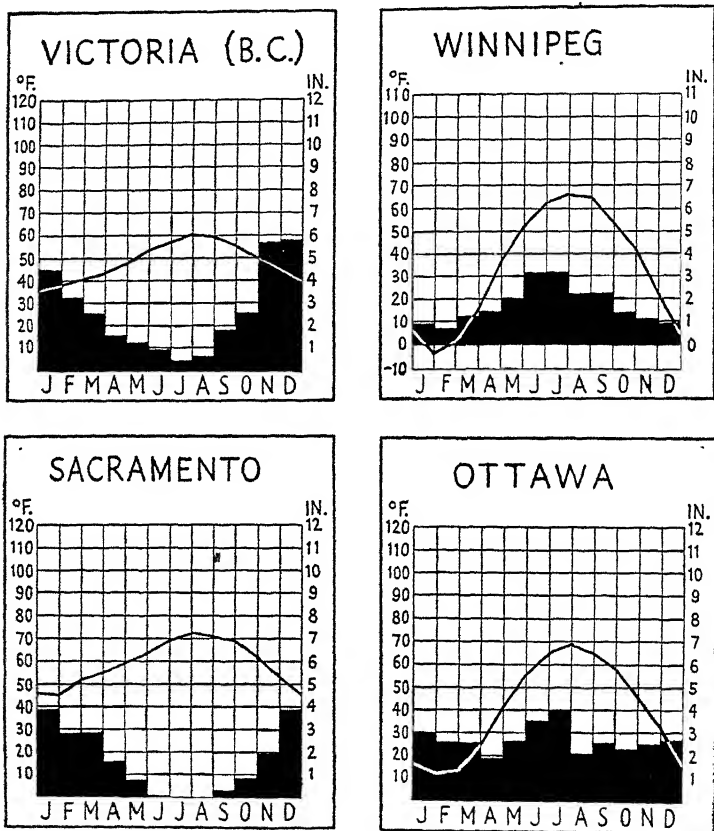


FIG. 11. Rainfall and Temperature

in summer, when the wind belts move towards the north, Central California lies in the belt of the north-east trades which blow off-shore and thus bring no rain to this region. The climate of this part of the west coast resembles that of the lands around the Mediterranean Sea, and other regions,

such as Central Chile, lying in similar latitudes on *the west coast of the continents*. Out of a total annual rainfall of 22 inches, San Francisco receives 13 inches during the winter months of December, January, and February; but none during June, July, and August.

In Southern California the prevailing north-east trade winds blow off-shore throughout the year. Thus this region, like the Atacama Desert in similar latitudes along the west coast of South America, is practically rainless.

The intermont plateaux, lying west of the main ranges of the Rockies and shut off from the Pacific by a double mountain barrier, are another dry region. Moisture mainly in the form of snow is precipitated on the higher parts of the mountains, but the plateaux themselves receive little rain, the amount decreasing from British Columbia southward. The High Plains, east of the Rockies, and lying in their rain shadow, also suffer from lack of rain.

But though the north-east trade winds blow off-shore in Southern California, they blow as on-shore winds on the eastern side of the continent bringing rain to the West Indies, Central America, and southern Mexico, especially to the regions lying on the windward side of the mountains. Thus, for example, the windward slopes of southern Mexico have an annual rainfall of over 80 inches, but the leeward coast has only 40 inches.

In summer, owing to the great heat, the air over the Central Plains of North America rises, forming a region of *low pressure* with in-flowing winds. The effect of this low-pressure system is very marked in the south-east of the United States where winds, flowing in from the Gulf of Mexico to take the place of the rising air over the land, bring heavy summer rains to this region. The West Indies and the south-east of the United States suffer from tropical cyclones, called hurricanes, which at times do great damage.

The Great Lakes cause rainfall in the adjacent areas of Eastern Canada and the North-East United States. Much of

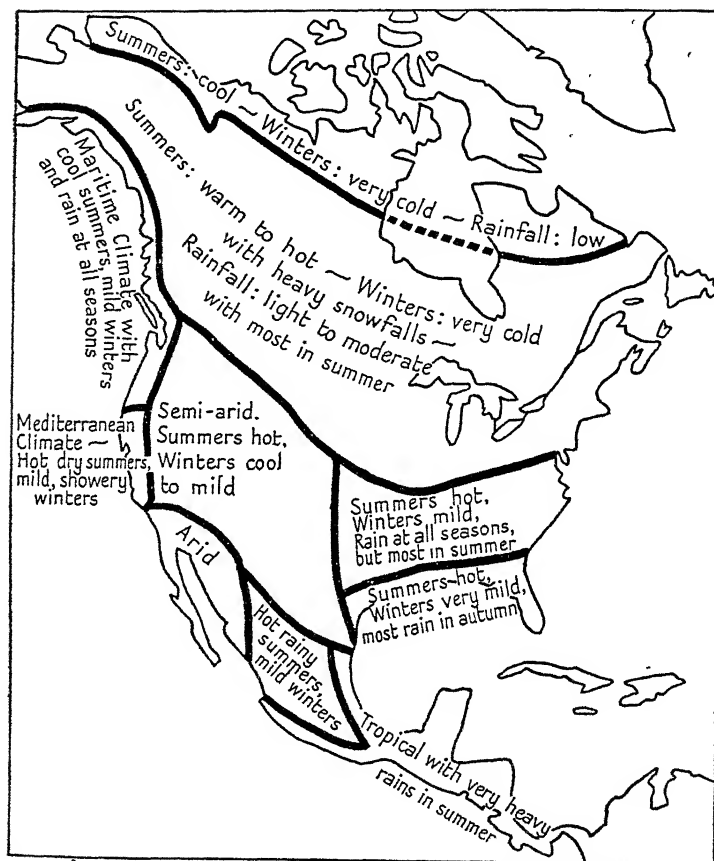


FIG. 12. Climatic Regions of North America (simplified)

this rain is brought by cyclones, whose favourite track is across the Lakes and along the St. Lawrence Valley to the Atlantic. A *cyclone*, or depression, is a local low-pressure area in which the pressure is lowest in the centre where the air is rising. The winds are cooled as they rise upwards into higher regions, and some of the moisture they contain is condensed and falls as rain, or in winter often as snow.

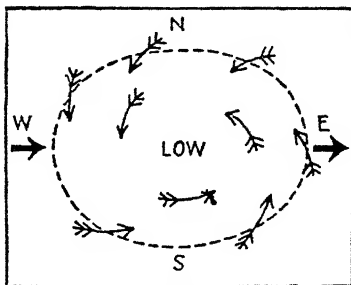


FIG. 13. Direction of winds in a cyclone (Northern Hemisphere)

EXERCISES

1. Study Fig. 12, which shows the chief climatic regions of North America. Then summarize the temperature and rainfall of each of the following regions: British Columbia, Central California, Southern California, Eastern Canada and the North-East United States, the South-East United States, the Coastal Plains.
2. Show how the climate of the Central Plains of the Mississippi is affected by (i) the presence of mountain barriers on the west and east, and (ii) the absence of such barriers on the north and south.
3. What can we learn about the temperature of North America from the following facts: (i) the January isotherms bend south over the land and north on approaching the coast; (ii) the July isotherms bend north over the land and south towards the coast?
4. In what part of North America are cyclones frequent? What effect do they have on the rainfall of this area?

CHAPTER IV

NATURAL VEGETATION, CROPS, AND ANIMALS

Natural Vegetation and Animals

It is always interesting to study the natural vegetation of a region and see how it is adapted to the configuration, the soil, and especially to the climate. In each climatic zone the plants and animals are suited to their environment, and each zone contributes, in greater or less measure, to the good of Man. In a journey from the north to the south of North America we should pass from frozen deserts with little rain to regions that are hot and receive rain throughout the year.

The *tundra* of North America and Eurasia forms a girdle round the North Polar regions. Those of North America are aptly called the Barren Lands, for they are covered with ice and snow for two-thirds of the year and below 1 foot or 18 inches the ground is permanently frozen. Nothing is more dreary than these icebound plains during the winter night. But early in July when the snow melts a veritable transformation takes place. Diminutive willows and larches begin to shoot and leaf, and the prevailing greenish-grey of the mosses and lichens is lightened by innumerable small flowering plants. Now the caribou (reindeer) and the moose leave the shelter of the forests and move northward; the white winter coats of the Arctic fox and Arctic hare change to a darker hue; and along the northern seaboard the polar bear hunts seals basking on the ice-floes. Meanwhile the sky is darkened by enormous flocks of ptarmigan and other birds flying north to nest. In the colder regions mosses and lichens drape the shrivelled branches of the stunted trees. The more sheltered areas are wooded, and in the valley of the Mackenzie River, owing to southerly summer winds, forests extend almost to the Arctic. On the south the tundra gradually merges into the cold forests. When seen from the air the trees in this transitional belt look rather like young

saplings, but on landing they are seen to be quite old: the growing period is so short that though new shoots appear in spring there is no time for the formation of fresh wood.

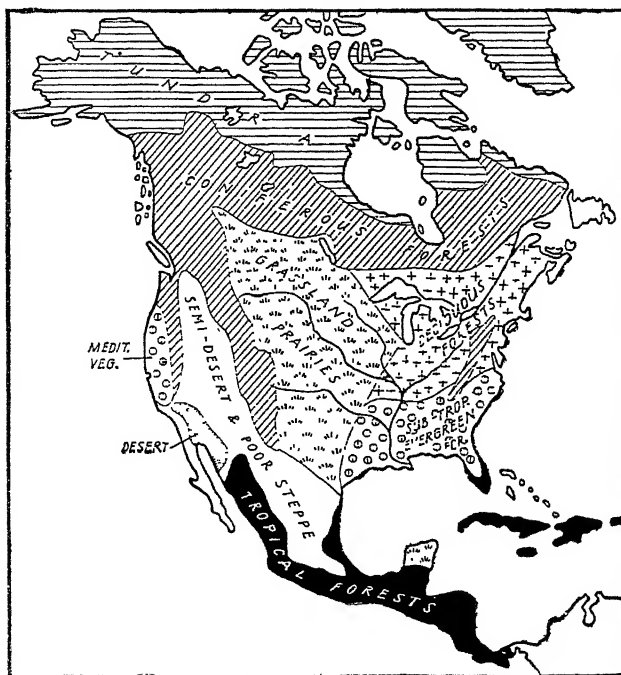


FIG. 14. North America: Vegetation Zones

The *cold forests*, along the southern border of the tundra, stretch for some 3,000 miles from the Atlantic to the Pacific. They have an average breadth of about 600 miles, though in the west they send out a tongue southward over the Cordilleras. The trees consist mainly of spruces, larches, pinos, and other conifers, as well as birches and aspens. In British Columbia, owing to the temperate rainy climate, the forests are extraordinarily fine and the Douglas firs and cedars are among the most magnificent in the world. (7) Towards the Great Lakes, where the climate is less

extreme and damper than farther north, conifers gradually give way to deciduous trees, such as oaks, maples, ashes, and chestnuts. These *broad-leafed forests* spread along the lower slopes of the Appalachians, growing more luxuriant and varied towards the south, where walnuts, magnolias, beeches, and other hard-woods mingle with the more common trees; while at higher elevations the deciduous trees are replaced by conifers. There is also a park-like belt of aspens and birches along the northern margin of the prairies.

As the climate grows milder and damper towards the south-east of the United States, *sub-tropical evergreen forests* predominate. One of the most useful trees is the long-leafed yellow pine whose wood is used for making floors, doors, and furniture. In the swampy glades cypresses abound.

The *Prairies*, a region of flat or rolling plains in the heart of North America, form a triangular area, narrowing southward, which extends from the cold forests to the Gulf of Mexico. On the west they rise to the foot-hills of the Rockies. Owing to their central position these natural grasslands have a low rainfall, which is, however, most abundant in the growing season when the ground has already been watered by melting snows. The amount of moisture is sufficient for grasses whose runners spread out near the surface, but as it is not enough to penetrate thoroughly into the sub-soil, trees are few except in the trough-like valleys, which are lightly wooded, and towards the margin of the forests where there is a park-like belt. In the east cereals have replaced the natural grasses; in the drier west stock-rearing is important.

As late as half a century ago the great herds of buffaloes (bison) which roamed over the prairies provided meat and skins for the Indian tribes then living on the plains. In 1871 it was estimated that there were some 8 million buffaloes on the prairies. But the white man outrivalled the Indian in the savage work of extermination, and within two years $4\frac{1}{2}$ millions of these noble animals had been killed for their

hides alone. Now they are reduced to some thousands, preserved in the Buffalo National Park, Wainwright, Alberta; and the Yellowstone National Park, United States. The Canadian government is also experimenting with cross-breeds suitable for stock-rearing on the prairies.

The *high intermont plateaux* of the Western Cordilleras become increasingly arid from British Columbia southward towards the Californian desert. Irrigated areas, like those of the Great Basin, form fertile oases, but outside the wooded valleys and pine-clad mountain slopes much of this region is covered with sage-bush and coarse grass growing in scattered tufts. The vegetation of the High Plains stretching along the eastern base of the Rockies, with their scanty and fluctuating rainfall, is very similar in character to that of the plateaux immediately to the west of the ranges. But the rough herbage is sufficient to feed enormous herds of cattle and flocks of sheep. Among the wild animals of the Rockies are the Mountain Sheep, often called the Big Horns, whose name tells of its enormous horns. These animals can live at great elevations and, thanks to thick pads on their hoofs, are able to leap from crag to crag with the greatest ease, and descend almost sheer cliffs.

⑥ *Tropical forests* are found in the West Indies, and the wetter east coast lowlands of Central America and Southern Mexico, which receive heavy rains from the North-East Trades, but the drier western seaboard of the mainland is clad mainly with scrub and light woodland.

⑦ The *Mediterranean region* of Central California was originally covered with evergreen trees and shrubs adapted to withstand the summer drought, but now much of the natural vegetation in this area has been replaced by the products of cultivation.

Both the cold forests and the deciduous forests are the home of fur-bearing animals, such as the squirrel, lynx, bear, and beaver, though the grizzly bear—most ferocious of his tribe—is confined to the Northern Rockies. Extensive

tracts of land, such as Jasper Park, 4,400 square miles, in Canada, and the Yellowstone National Park, have been set aside for the preservation of wild life.

Agricultural and Pastoral Belts

In a continent so large as North America, there are vast areas whose climate and relief vary little, and where the

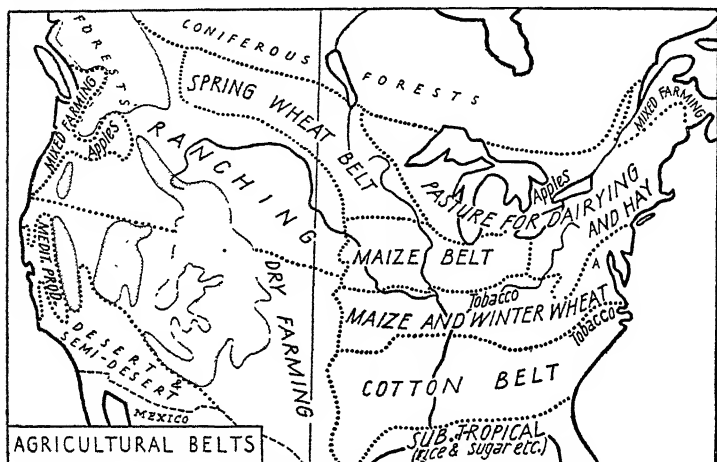


FIG. 15. North America: Agricultural Belts

same kinds of crops can be grown. The chief agricultural and pastoral belts shown in Fig. 15 well illustrate the influence of climatic factors.

1. *The Spring Wheat Belt* extends from Central Canada to the middle Mississippi. The winters are long and severe, but the rainfall is sufficient and the summers, though short, are warm and sunny enough to ripen the grain.

2. *The Maize Belt.* South of the spring-wheat belt, the shorter and less severe winters, the longer and hotter summers, and the greater rainfall provide ideal conditions for the cultivation of maize.

3. *The Maize and Winter-Wheat Belts.* In this belt, lying

to the south of the maize belt proper, the still milder winters allow wheat to be sown in autumn and harvested in early summer before the maize crop is garnered.

4. *The Cotton Belt* is bounded on the north by the invisible line marking the limit of 200 days free from frost; on the west by the meridian 100° W., beyond which the rainfall is insufficient for cultivation without recourse to irrigation.

5. *The Sub-Tropical Belt*, fringing the Gulf of Mexico and including the Peninsula of Florida, produces sugarcane, rice, and warm temperate and sub-tropical fruits.

6. *The Ranching and Dry Farming Belts* lie in the region of scanty rainfall (from longitude 100° W. to the Rockies).

7. *The Dairy Pasture, Hay, and Mixed Farming Belt* is found south of the coniferous forest belt, in the region of the Great Lakes, and stretches north-eastward through the St. Lawrence Lowlands. The relatively damp climate favours dairying.

8. In the *Mediterranean Region* of Central California enormous quantities of warm temperate fruits and vegetables are grown on irrigated lands.

9. In *Mexico and Central America* the kinds of crops grown depend mainly on altitude. Hence, for example, bananas are cultivated on the wet east coast-lands; coffee at higher elevations; and cereals on the plateau.

EXERCISES

1. Describe the different kinds of forests you would pass through if you were to travel from the south of Hudson Bay along the slopes of the Appalachians to the Peninsula of Florida. Show how they vary with the climate and in each case name one or two typical trees.

2. Give an account of the natural vegetation and the cultivated crops of that part of the prairies lying between the south of Lake Winnipeg and the middle Mississippi valley, i.e. as far south as St. Louis. Account for the distribution of the crops.

3. Name *six* of the wild animals of North America. In the case of *two* of them show how they are adapted to their environment.

4. Name two regions in North America where irrigation is essential for the cultivation of many crops. In each case explain why this is so.

CHAPTER V. NEWFOUNDLAND

Britain's Oldest Colony

IN May 1497 John Cabot sailed from Bristol and, after weeks of buffeting by the Atlantic waves, reached a rugged island lying athwart the Gulf of St. Lawrence. This was Newfoundland, to-day Britain's oldest colony. Cabot also sailed along the coast of *Labrador* which is now a dependency of Newfoundland.

Newfoundland lies on the continental shelf of North America, which extends for some 200 miles south-east of the island, the area being called the Grand Banks. The shallow waters covering this submarine platform are rich in tiny organisms, called plankton, and other material brought down by the Labrador Current, which provide an inexhaustible food-supply for fish. From early times until the present day the cod-fisheries of the Banks have been the mainstay of Newfoundland.

In late spring and summer huge icebergs from Greenland travel down with the Labrador Current, which flows along the east side of the island. These icebergs do not melt until they meet the warm waters of the Gulf Stream. As they are a menace to shipping, vessels plying between Europe and Canada set a more southerly course, from April to June, than during the rest of the year. To protect steamers from these floating dangers, cutters of the *International Ice Patrol* broadcast messages, telling of the position of ice in the North Atlantic and the probable track of the icebergs.

Chilled by the cold water and ice, the onshore winds reduce the temperature, especially in Labrador. The cold air over the Labrador Current, by mingling with and cooling the warm air over the Gulf Stream, causes partial con-

densation, with the result that fogs are frequent. They are a handicap to fishermen, and are troublesome in coastal districts; but they do not extend far inland. Rain falls at all seasons. As the prevailing westerly winds blow across Newfoundland from the mainland of North America, its climate is more extreme than corresponding areas in Western Europe, where conditions are moderated by the fact that the westerlies reach them after crossing the Atlantic.

Much of the interior of Newfoundland is unsettled. Only about 7 per cent. consists of arable land, for neither climate nor soil is well suited to agriculture, though potatoes are grown, hay is a common crop, and some dairying is carried on. Forests of pine, spruce, larch, and other coniferous softwoods cover about one-quarter of the island. They yield timber for wood-pulp, which is manufactured into paper at *Corner Brook* and *Grand Falls*, where the Middle Exploits river is harnessed for hydro-electric power. Minerals include copper, and some coal, mined near St. George's Bay on the west coast. More important is iron-ore, obtained from Bell Island, in Conception Bay, and along the west coast, and sent to be smelted at Sydney, Cape Breton Island.

Most of the 290,000 Newfoundlanders live in coastal villages and small towns at the head of bays. *St. John's*, the capital, only large town, and chief port, handles the bulk of the overseas trade. Through it are exported fish and fish products, and paper and pulpwood sent, in about equal proportions, to the United States and the United Kingdom. Imports include coal; woollen goods which come chiefly from the United Kingdom; machinery and salt pork from the United States; and flour, dairy produce, and fruit from Canada. *St. John's* is the chief centre for the Grand Banks fisheries, and for sealing-vessels visiting Arctic waters in spring. *Port Botwood* is a trans-Atlantic airport.

In 1940 Great Britain granted the United States permission to establish naval and air bases in Newfoundland, and in Bermuda and certain British islands in the West Indies.

The Grand Banks

The Grand Banks, which stretch from Newfoundland to Nova Scotia, cover an area somewhat greater than that of the British Isles. Their shallow waters are especially noted for cod, but halibut, hake, and other fish living near the bottom of the sea, as well as surface-swimming fish, such as herrings, are caught.

On the Banks steam trawling has not developed to any extent, partly because the nature of the bottom is imperfectly known. The vessels mainly used are sailing craft of from 60 to 100 tons, each carrying a crew of from twelve to twenty men who do the actual fishing in flat-bottomed boats, called dories, each manned by two men. Vessels from Newfoundland, Canada, the United States, France, and Norway share in the fishing. Both trawl and hand lines are used. Two or three hundred fish are often caught on one trawl line. When the fish are biting the dories are loaded down in a few hours, and make several journeys to their parent ship during the course of a day. One by one, as night approaches, the dories return with their final catch. Once aboard their ship the men 'mug up' hard bread, biscuits and hot tea, and are soon busy splitting, cleaning, and salting the catch to preserve it until it can be landed and dried. At St. John's and coastal villages in Newfoundland, at Halifax in Nova Scotia, and at fishing ports in the north-east of the United States we may see lines of cod hung up to dry, and cod-liver oil being prepared. Much of the fish is sent to Brazil, and quantities are also exported to Portugal, Spain, and other Mediterranean countries, where it is in demand owing to the meatless days prescribed by the Roman Catholic Church.

Inshore fisheries are carried on within 1 to 10 miles of the Newfoundland coast by sailing-, rowing-, and motor-boats. The catch includes salmon (exported in frozen form to England), herrings, mackerel, and flat fish, as well as

oysters and lobsters, which are popular dishes in the North-East United States.

Early in March sealing-vessels set out from St. John's on their annual trip and steam northwards through *leads* (clear channels) in the ever-increasing ice. Onward the vessel goes into the heart of the ice-fields—fields of gleaming white that stretch onward to the horizon where trapped icebergs, awaiting the melting of the waters, stand clear-cut against the northern sky. The seals are clubbed and skinned on the ice and the pelts collected and stored in the holds of the ships, until after several weeks' work the now laden vessels start for home. The pelts are tanned for leather; the seal-fat is refined for oil which is exported in tankers, ultimately finding its way to soap-factories.

Fishing, Newfoundland's most important industry, provides employment for more people than any other occupation. But it is a part-time job, and many of the fishermen work on their farms, in mines, or in lumber camps during winter.

EXERCISES

1. Describe three ways in which the Labrador Current affects life in Newfoundland.

2. The chief products of Newfoundland are paper, pulpwood, and other timber products; cod and other fish; and iron-ore and other minerals. The chief imports are coal; textiles (mainly woollen goods); machinery; salt pork; tea; and flour. What can we learn from these exports and imports about the geography of the country? Give your reasons.

3. (a) What do you mean by the continental shelf? (b) Why is the continental shelf important to Newfoundland? (c) Give an account of the Grand Bank fisheries, describing how the fish are caught and prepared for market, and the chief uses of the most important fish obtained from these waters.

CHAPTER VI

THE BIRTH AND GROWTH OF CANADA

The Beginnings of Canada

THE story of Canada is one of absorbing interest. It is a story of high adventure, of one long fight between Man and Nature, of conquest and colonization, of exploration, and of expansion so great that within three hundred years the country grew in size from a series of trading settlements along the St. Lawrence until it became the largest single unit in the British Commonwealth.

Nearly forty years had passed since Cabot's visit when in 1534 Jacques Cartier, master pilot of St. Malo, sailed into the Gulf of St. Lawrence. Subsequently he travelled more than 1,000 miles up stream, through densely forested country threaded by a network of tributary streams, and by the winding trails of the Iroquois and other Indian tribes. Like Cabot and Columbus, Cartier hoped to find a way to India by travelling west, but his immediate object was by exploration, trade, and missionary enterprise to establish a colony in the New World.

Cartier paved the way for Champlain, founder of Quebec, who early in the seventeenth century added to the Realm of France those lands bordering the St. Lawrence which became the nucleus of Canada. A man of vision, but also a man of action, Champlain and the intrepid pioneers who succeeded him travelled by river, lake, and forest trail far into the interior, reaching Lake Superior on the west, Hudson Bay on the north, and the Mississippi valley on the south. By the end of the seventeenth century many French peasants, or *habitants*, had settled along the St. Lawrence between Quebec and Montreal, where the *seigneuries* ran far back, in narrow rectangular strips, from the waterfront into the virgin forest, for it was essential that each community

should have access to the river, their only highway. This arrangement has survived to the present day (see Plate III and Fig. 16).

But above all it was for its furs that Canada was valued by the early colonists. To obtain control of the fur trade French and English fought, year in year out, drawing Indian tribes into conflicts which often flamed up into open

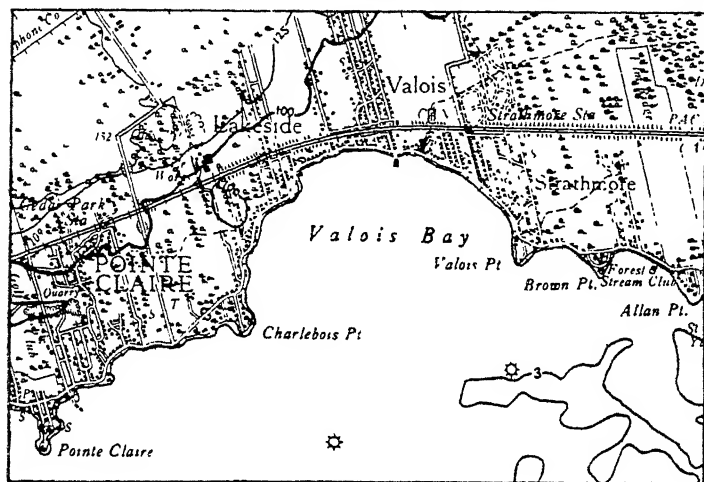


FIG. 16. Strip Farms, Quebec

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warfare. For nearly two and a half centuries the French and British struggled for the control of Canada, but in 1760 the country passed under British rule, since when two peoples so long opposed have united to develop their joint heritage. At first the British province of Canada occupied only a relatively small area around the St. Lawrence, and did not include Nova Scotia, Prince Edward Island, and New Brunswick. The last province, like Ontario, was settled mainly by United Empire loyalists who, wishing to remain under the British flag, flocked in from the United States after the American War of Independence.

In 1791 Upper and Lower Canada, as Ontario and Quebec were then known, were granted some measure of self-government, as too at a later date were the Maritime Provinces lying to the east. But it was not until 1867 that the British North America Act brought into being the *Dominion of Canada* in which each of these provinces had its own Government and Legislature, and a Federal Government and Parliament were also established.

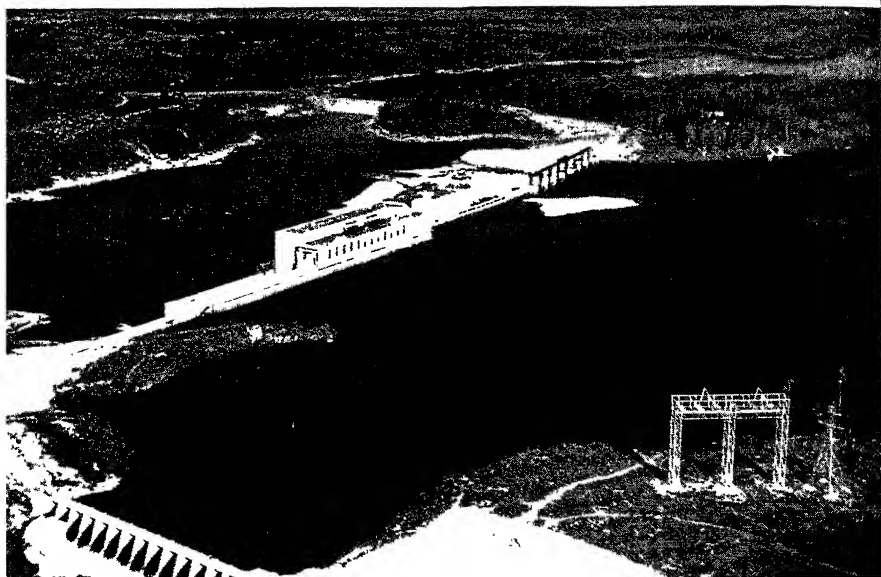
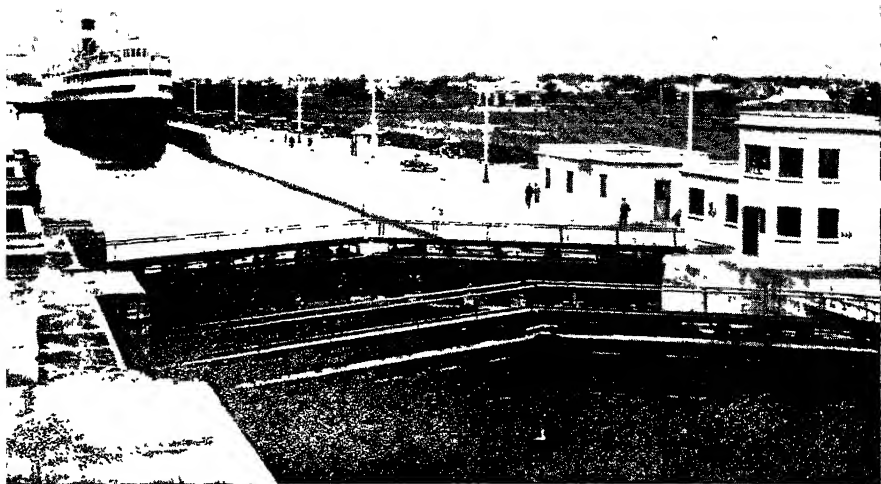
In order to unite all the British lands of North America into one federation, the vast territories of the Hudson's Bay Company were transferred to the Dominion, part becoming Manitoba, now the most easterly of the prairie provinces. In 1871 British Columbia attained self-government and agreed to join the Dominion on condition that a railway was built to link her with Eastern Canada. Gradually the line was pushed westward through immense forests, along the shores of Lake Superior, over the wide-spreading prairies, and across the Rockies to the Pacific. In 1885 the great trans-continental line from Montreal to Vancouver was finished. The completion of the Canadian Pacific Railway, as it was called, which was followed by further extensions of the railway net, set the seal upon the development of the prairies. A wave of settlers from Eastern Canada, Europe, and the United States streamed westward. Some made their homes in Manitoba; others spread farther into the prairies, where, in 1905, the increase in the population justified the creation of the provinces of Saskatchewan and Alberta, the two youngest provinces of the Dominion.

The region lying north of the prairie provinces and British Columbia, which is controlled by the Federal Government, constitutes the North-West Territories and Yukon. This enormous area is inhabited mainly by white traders and miners and scattered Indian and Eskimo tribes, but so great are its mineral resources that it is rapidly becoming one of the leading mining areas in the Dominion.



3. CANADA: OLD AND NEW

(Above) Cultivated by *habitants*, these 'strip farms' along the St. Lawrence are survivals of the old *seigneuries* of the early French settlers. Compare the photograph with the map (Fig. 16). (Below) A general view of Trail, B.C., on the Columbia River. The chimneys of the huge smelter of the Consolidated Mining and Smelting Company may be seen on the right. The surrounding hill-sides are almost devoid of vegetation, but much has been done to abate the injurious effects of fumes from the smelter (see p. 84).



4. WATER TRANSPORT AND WATER POWER

(Above) The Welland Canal, constructed to avoid the Niagara Falls, enables large Upper-Lake steamers to travel from Lake Erie to the head of Lake Ontario. (Below) This Power Station, owned by the City of Winnipeg, at Slave Falls, on the Winnipeg River, reminds us of the great part hydro-electric power has played in the development of Canadian industry (see p. 65).

The Peoples

To-day, with an area of $3\frac{1}{2}$ million square miles, Canada covers almost half of North America. But though the Dominion is somewhat larger than the United States, its population is only $11\frac{1}{2}$ millions compared with the 122 millions of its neighbour. But the real disparity is not so great as it appears, for the severe climate of Northern Canada prohibits close settlement in this region, which comprises at least a third of the country. The relatively small population is also due to the fact that only during the last half-century has Canada been steadily opened up, especially the West, which awaited the coming of the railways. So rapid indeed has been the progress of the Dominion in recent times, that between 1901 and 1937 the population doubled itself. There is no doubt whatsoever that the country is capable of supporting a far greater number of inhabitants than at the present time. Its full development has only just begun and it is a land of vast resources, with great forests, a wealth of minerals, and enormous supplies of developed and potential hydro-electric power. Moreover, the Dominion has thousands of square miles of some of the richest agricultural land in the world, as well as valuable fisheries.

The map (Fig. 26) shows that most of the people live in a belt of country adjacent to the United States frontier, and that the greatest concentration is found in the St. Lawrence Lowlands, which contain about 60 per cent. of the total population. The Maritime Provinces along the Atlantic seaboard are fairly well peopled, especially Prince Edward Island, which, with forty persons to the square mile, has the highest provincial density in the Dominion. The whole of the north, as we have seen, is very sparsely inhabited.

In 1940 the population of Canada was $11\frac{1}{2}$ millions, of whom just over 8 millions were Canadian born, a little more than a million of British birth, and about 2 millions of

foreign extraction. Of the Canadian born somewhat more than 5 millions were of British descent, and 3 millions were of French stock. Most of the Canadians of French speech and origin live in Quebec Province, where they constitute 80 per cent. of the population, but numbers have settled in Northern Ontario and on the prairies. The British are more widely spread throughout Canada: in the Maritime Provinces, Ontario, and British Columbia they form the majority of the population; in the Prairie Provinces they comprise somewhat more than 50 per cent. People of foreign extraction include emigrants from the United States, as well as those of German, Scandinavian, Finnish, Ukrainian, Polish, and Dutch origin. There are also 122,000 Indians and 6,000 Eskimos, as well as a number of Japanese and Chinese, found mainly along the Pacific seaboard.

In many villages on the prairies and also in some other parts of Canada the majority of the inhabitants belong chiefly to one race, and in towns, too, racial groups tend to congregate in certain quarters. The aim of the Canadian Government is to absorb these various peoples into the life of the Dominion and to turn them into good Canadians. Except in French-speaking communities pupils in Canadian schools are taught in English. In the 'New Canadian' classes, into which young immigrants of foreign nationalities are first drafted, the children soon learn to master the English tongue. Every morning the Union Jack is hoisted in the playground. To some this may seem unimportant. But to Canadians the flag is a symbol of that freedom which is the life-blood of the British Commonwealth.

Relations with the British Commonwealth and the United States. Geographical, racial, and family ties, as well as a common language, foster close relationships between Canada and the United States. These English-speaking nations share, in some measure at least, a common heritage from Britain, and both enjoy a democratic form of government. And it must not be forgotten that nine out of every

ten Canadians live within 200 miles of the United States frontier across which there is a constant coming and going. A Canadian, for instance, need not have a passport to enter the United States: a person of any other nationality, including British, must do so. American newspapers, periodicals, and books have a wide circulation in Canada, and American

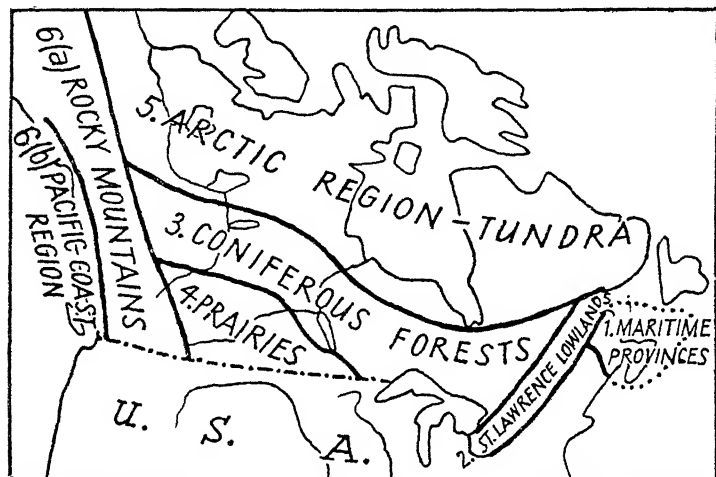


FIG. 17. Canada: Regions

radio programmes are extremely popular in the Dominion. Much American money is invested in Canada. The Dominion buys more from the United States than from any other country, while Britain and the United States are her best customers. Moreover, the question of Canadian defence is linked not only with that of Britain, but also with that of the United States, and since 1940 Canada and the United States have had a *Joint Defence Board* to co-ordinate the defence of the Western Hemisphere. Thus there are many bonds between the two neighbours, who, to a great extent, have a similar outlook both towards their own internal problems and towards the world at large.

Further, as a self-governing Dominion, Canada plays an

important part as a link between the British Commonwealth and the United States. There is a Canadian High Commissioner in London and a British High Commissioner in Ottawa, the Federal Capital. The Dominion is represented by ministers in the United States, France, and Japan, and each of these countries, as well as Belgium, has a minister in Canada.

Regions of Canada

We may divide Canada into six regions: (1) the Maritime Provinces of Eastern Canada (Nova Scotia, New Brunswick, and Prince Edward Island); (2) the St. Lawrence-Great Lakes Lowlands, stretching through the south of Quebec Province into south-west Ontario; (3) the Coniferous Forest Belt; (4) the Prairie Provinces of Manitoba, Saskatchewan, and Alberta; (5) the Arctic Region, lying north of the Forest Belt, and stretching through the North-West Territories into Yukon; (6) British Columbia, comprising (a) the Rocky Mountain Region, and (b) the Fiorded Pacific Coast.

Each region contributes something to the well-being of the Dominion, which, rich in material wealth, is blest above all in her alert and virile peoples, drawn mainly from the stocks of Britain and France.

EXERCISE

How do you account for the following facts: (a) Quebec Province is inhabited mainly by French-speaking Canadians; (b) most of the people living in the Maritime Provinces, Ontario, and British Columbia are of British origin; (c) most of the scattered inhabitants of the North-West Territories are Indians and Eskimos; (d) there are a number of Chinese and Japanese along the Pacific seaboard?

CHAPTER VII

THE MARITIME PROVINCES OF CANADA

THE Maritime Provinces consist of *Prince Edward Island*, the smallest but most densely peopled province in Canada; *Nova Scotia*, which includes Cape Breton Island; and *New Brunswick*. The last-named province is almost cut off from the peninsula of Nova Scotia by the Bay of Fundy—a funnel-shaped opening noted for its exceptionally high tides, which rise 50–70 feet. As the coast is much indented and fringed on the north by islands, no part of this eastern region lies far from the sea, and life is attuned to the maritime environment. An undulating, well-watered and well-timbered region, the Maritime Provinces are isolated from the rest of the Dominion by rugged forested mountains into which Maine (U.S.A.) cuts a deep wedge. There is abundant rain with heavy snowfalls in winter. The summers are warm; the winters cold, mainly because the prevailing north-west winds blow from the interior of the continent.

Fishing, lumbering, farming, and mining are the chief occupations. Forests of conifers and deciduous trees, including maples, cover a considerable area in Nova Scotia and New Brunswick. Most of the sawmills lie along the rivers, which provide transport and falls for power. The smaller timber is ground for wood-pulp, the semi-raw material of the paper industry. Larger trees are sawn into beams and planks, of which large quantities are needed for house construction, for in the Maritime Provinces (as in most parts of Canada and the United States, outside the big cities) houses are built of wood.

The indented coast-line and the shallow waters covering the continental shelf favour fisheries. Many vessels visit the Grand Banks, returning with cod, haddock, and halibut. But even more important are inshore fisheries carried on within

10 to 12 miles of the coasts. *Lunenburg*, south of Halifax, and *Digby*, on the Bay of Fundy, are two of many small towns and villages whence fleets of boats put out to fish for herring, salmon, mackerel, haddock, and lobsters. Smoked haddock are exported chiefly to Ontario; lobsters are canned for the European market. Many of these inshore fishermen farm as well as fish.

Comparatively little wheat is now grown in the Maritimes, as farmers prefer to devote their attention to other crops rather than compete with the large-scale production of the prairies. Moreover, the damp climate is not particularly favourable for cereals, though well suited for hay, fruit, and potatoes. Mixed farming is the general rule. In winter animals are housed in barns, which have hip-shaped roofs (see Plate V), a type which gives plenty of storage space for fodder crops. Apples are widely grown, notably in Nova Scotia, where the *Annapolis Valley*, running parallel to the eastern shores of the Bay of Fundy, is a celebrated producing area. The lower lands were diked and drained by early settlers, and the whole valley, with its mellow homesteads and orchard-studded slopes, is singularly beautiful, especially at blossom time. The farms are conveniently placed for shipping their apples by water, a cheap and easy means of transport. The valley has a more moderate winter climate than most parts of the Maritimes. This is due partly to its sheltered position, and partly to the fact that the prevailing north-west winds, blowing over the ice-free waters of the Bay of Fundy, are relatively warm. Hence the district does not suffer from severe and protracted frosts, so often fatal to fruit-trees.

Prince Edward Island, aptly called 'Canada's million-acre farm', has a greater proportion of farming land than any other province in the Dominion. The dairy industry is associated with the rearing of pigs and poultry; and bacon, eggs, butter and cheese are the chief goods exported from *Charlottetown*, the provincial capital. The increasing

price of land in the island points to an improvement in farming methods, which have resulted in higher yields per acre. Fur farming is a lucrative industry in Prince Edward Island, Nova Scotia, and New Brunswick, in each of which silver foxes and other animals are bred for their skins.

There are valuable coal-fields at *Sydney*, Cape Breton

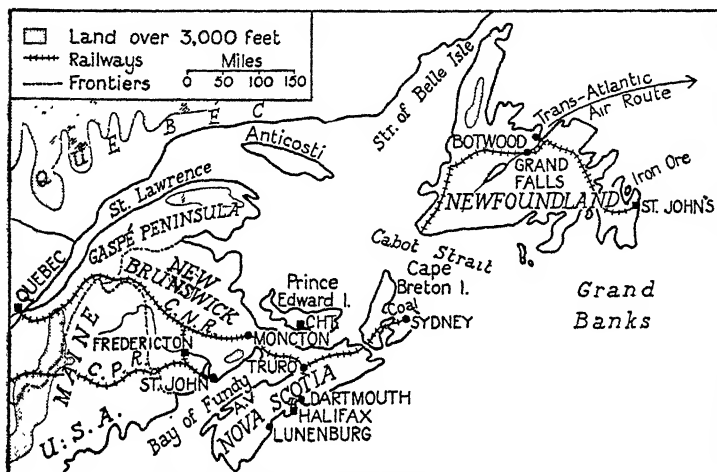


FIG. 18. Canada: The Maritime Provinces

Island, whose mines produce three-quarters of the total output of Nova Scotia. As the mines lie along the coast, and in some cases extend under the sea, they are favourably placed for exporting coal and for importing iron ore from Newfoundland, which is smelted, with local limestone for flux, in blast furnaces at Sydney. Coal is also mined in New Brunswick, east of *Fredericton*, the capital.

As the St. Lawrence is frozen over in winter, the ice-free ports of Halifax and St. John handle the bulk of Canada's overseas trade at this season. *Halifax*, the capital of Nova Scotia, situated on a superb harbour, is the terminus of the Canadian National Railway, and with the neighbouring

town of *Dartmouth* is the leading industrial centre in the Maritimes. The Canadian Pacific Railway runs to *St. John*, which grinds and exports wheat, and refines cane-sugar imported from the West Indies.

The people of the Maritime Provinces are chiefly of British, French, and German stock. In the sixteenth century French settlers colonized Acadia (the region now comprising Nova Scotia and New Brunswick). They were followed by colonists from Scotland who gave Nova Scotia its present name, a name that is still appropriate, for the Scottish strain is particularly strong in this province.

EXERCISES

1. Name *four* of the chief occupations in the Maritime Provinces. Show how *two* of them are related to the geographical conditions.

2. Account for the presence of (a) flour-milling at *St. John*, (b) fruit-growing in the Annapolis Valley, and (c) iron and steel works at Sydney, Cape Breton Island.

CHAPTER VIII

THE ST. LAWRENCE-GREAT LAKES LOWLANDS

A Mixed Farming Area

THE St. Lawrence Lowlands, which lie between the rugged forested lands of the Canadian Shield and the Northern Appalachians, form the southern portions of the provinces of Quebec and Ontario. From Quebec they extend in a comparatively narrow belt along both sides of the St. Lawrence, but towards the west they broaden out into the Lake Peninsula, an undulating region lying between Lakes Ontario, Erie, and Huron. The lowlands are covered with thick glacial drift whose mixed sands and clays, together with alluvial soils in the vicinity of the rivers, furnish rich agricultural land. As they extend from north-east to south-west for nearly 700 miles there are naturally variations in climate. But broadly speaking the summers are hot, with ample rain, the winters cold, snowy, bracing, and sunny.

Despite the growth of manufacture in recent years, agriculture is still the most important industry in the St. Lawrence Lowlands. The climate is well suited to cereals, but competition from the grain lands of the prairies led to the development of mixed farming, the production of oats, hay, sugar-beet, potatoes and other roots being closely associated with stock-rearing. Somewhat more than half the dairy cows, sheep, pigs, and poultry, and nearly half the beef cattle in Canada are found in those portions of the provinces of Quebec and Ontario which lie in the lowlands. As the winters are too severe for animals to remain out of doors, vetches, clovers, lucerne, and green maize are grown for fodder during the cold weather. On many farms this produce is stored in silos where it is allowed to ferment. These airtight towers are so constructed that freshly mown crops can be packed down in them while still damp, whereas when grass is turned into hay it must be thoroughly dried

before being stacked. The fodder is drawn from the bottom of the silo when required.

✓ Dairying is important in both Quebec and Ontario. On the larger farms milking-machines are used. They are of great help to farmers in a country where even in populous districts agricultural labour is not plentiful, and wages are

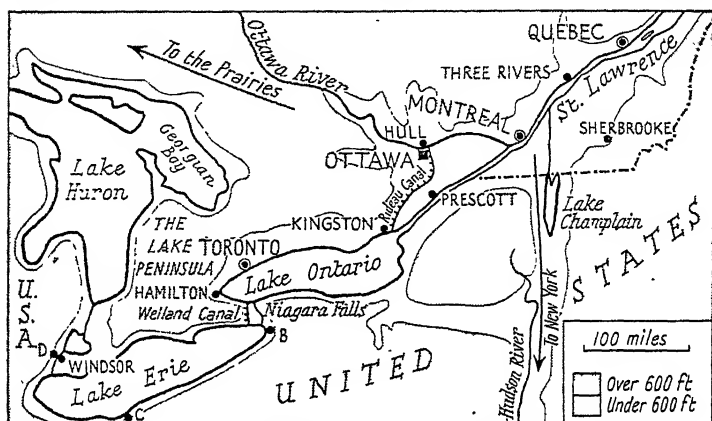


FIG. 19. The St. Lawrence Lowlands

high compared with rates in the British Isles. There is a great demand for milk, for Canadians drink a greater quantity per head than British people. Even in winter ice cream is popular. This is possibly due to the fact that as most houses have central heating they are kept at a much higher temperature than those in England, and the dry atmosphere stimulates a desire for cooling drinks and foods. Condensed and powdered milk are manufactured, and vast quantities of butter and cheese are made in the factories. For these products, and for bacon, hams, and eggs, there is a market in the urban areas, and an overseas market in Britain. England imports much cheese from Canada, the Province of Ontario producing the greater part.

The climate of the Lake Peninsula is less extreme than

that of the rest of the St. Lawrence Lowlands. This is partly because of its southerly latitude, which corresponds to that of Italy, but mainly because of the moderating influence of the surrounding lakes, for, as we know, a body of water takes longer to heat than the land. The melting ice on the lakes delays the coming of spring, and in summer the surrounding area is also cooled somewhat by the water, which has not yet attained its maximum heat. But in autumn and winter the lakes raise the temperature of the neighbourhood. Hence the cool springs hold the vegetation in check until danger from frost is over, but the autumns are prolonged, being exceptionally mild and free from late frosts. These conditions favour fruit production, shown by the many apple orchards along the northern shores of Lakes Ontario and Erie, and the vineyards and peach orchards of the Niagara Peninsula. The Lake Erie belt also produces tobacco, while maize, used for fattening pigs, is an important crop.

Hydro-electric Power

The St. Lawrence-Great Lakes Lowlands are the chief manufacturing area in the Dominion. Yet they lack coal and for many years were dependent mainly on supplies from the United States.

The very rapid industrial progress of this important region since the beginning of the present century has been largely due to the development of hydro-electric power. The water-power resources of Canada are unsurpassed by those of any country except the United States. Thanks to the abundant rainfall of Eastern Canada, and the many falls and rapids in this region, Quebec and Ontario have greater water-power resources than any other part of the Dominion, and their power installations represent more than three-quarters of the country's total. Many southward-flowing rivers from the Canadian Shield, such as the Ottawa, the St. Maurice, and Saguenay, descend into the St. Lawrence

valley by falls, which are utilized by power-stations. From such stations great cables carry the power to towns and villages in all parts of Ontario and Quebec.

Few power-sites are so ideally situated as Niagara Falls, whose resources are shared by Ontario and New York State. Niagara River, carrying the drainage of a large region of abundant and well-distributed rainfall regulated by natural storage in four of the five Great Lakes, pours over a vertical cliff into the seething cauldron below. The water is carried to the generating stations from a point several miles above the Falls, and has a straight drop of some 200 feet from the higher level to the mighty turbines of the generating stations.

Manufactures and Towns

The use of hydro-electricity halves the cost of manufacture. In Canada practically the whole of the electricity generated for sale is produced by water-power, and the average consumption per head is greater than that of any country in the world. This form of power has to a great extent replaced coal. Nova Scotian coal is shipped up the St. Lawrence as far as Montreal, but Ontario imports most of its supplies from the United States. The majority of the industries depend for their raw materials on the timber and minerals of the Canadian Shield; on the agricultural produce of the surrounding farmlands; and on grain from the prairies, which like iron-ore from Minnesota (U.S.A.) is conveyed cheaply by way of the Great Lakes. South of the Lakes lies the most densely peopled area in the United States which provides a market for considerable quantities of agricultural produce and wood-pulp.

The St. Lawrence opens the way to world markets. Across the Atlantic lie the British Isles and other countries of Western Europe eager to exchange their manufactured goods for Canada's primary products, like wheat; her semi-raw materials, such as wood-pulp; and prepared foodstuffs. The above factors, supplemented by adequate rail and road

transport, and by protective tariffs, have played an outstanding part in transforming the riparian region, stretching from Lake Ontario to Quebec, into the leading industrial and most densely peopled area in Canada. Hence it is not surprising that though the St. Lawrence-Great Lakes Lowlands cover little more than one-tenth of the Dominion, they contain about 60 per cent. of the total population.

With the development of factories people tend to leave the country for the towns. Out of every ten people in the Lowlands six live in urban areas, and the number is increasing, a fact which points to the steady development of manufacturing. Of the seven largest cities in Canada, five are situated in this region—two on the St. Lawrence, one on a tributary, and two on Lake Ontario.

Montreal (820,000), the largest city and chief port of Canada, and greatest grain-exporting port in the world, is situated on an island, about 1,000 miles from the open Atlantic. It stands at the head of ocean navigation at a point where a number of land routes meet the waterway. In addition to those running through the St. Lawrence Valley, an important one up the Ottawa valley is followed by the Canadian Pacific Railway, which continues west to the prairies. Road, railway, and canal traverse the Richelieu valley, past Lake Champlain, and thence down the Hudson to New York. A leading manufacturing centre, Montreal turns prairie grain into flour; converts timber into sawn wood, wood-pulp, and paper; makes machinery and clothes which find a market ready to hand. Like Quebec, Montreal is a French-speaking city, though most of the people also speak English.

It was Champlain who raised the walls of *Quebec* (130,000) on an easily defended plateau overlooking the St. Lawrence (Plate VIII). And this city, the most picturesque in Canada, is as French to-day as when it was founded. Behind the docks and wharves lining the water-front straggles the Lower Town, which irresistibly recalls the older

quarters of Havre or Rouen. Narrow winding streets, with such names as 'Sous le Cap', climb to the Upper Town, with its old walls, and ancient citadel occupying a commanding site. A terminus for the larger ocean liners, Quebec possesses one of the largest dry docks in the world.

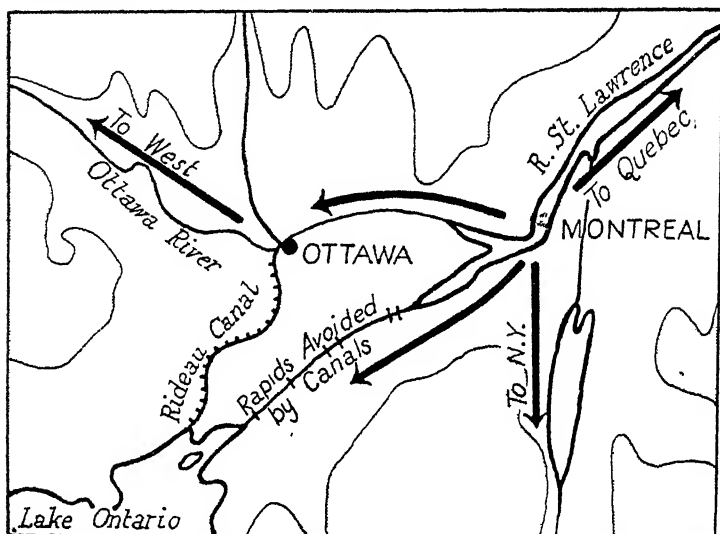


FIG. 20. Canada: Sites of Montreal and Ottawa

It manufactures paper, cotton and woollen goods, with power from stations on the Saguenay, St. Maurice, and St. Lawrence Rivers. Its exports include wheat and timber, but like Montreal it is handicapped because the St. Lawrence is blocked with ice for about five months in the year.

Ottawa (126,000), the Dominion capital, stands on a cluster of low hills overlooking a bluff on the Ottawa River, near a point where two tributaries enter the main stream. It is the outlet for a vast forest area, and in spring millions of logs are floated down to Ottawa, which, like *Hull* on the opposite bank of the river, is a centre of the lumber industry. The Rideau and Chaudière Falls provide power.

Below the last-named the Ottawa River is navigable to its confluence with the St. Lawrence; the Rideau Canal connects it with Kingston, on Lake Ontario. At Ottawa are situated the Federal Houses of Parliament, the chief government offices, and the residence of the Governor-General, the representative of the King.

Toronto, with its tall buildings and its superb waterfront along Lake Ontario, to some extent reminds the visitor of an American city, but on closer acquaintance it shows distinct resemblances to one in England. If tradition counts, this is not surprising, for Toronto was founded by United Empire Loyalists who migrated from the United States after the War of Independence. Besides being an important port, it is a focus of railways serving the Lake Peninsula, and a distributing and collecting centre. The second largest city, and most important manufacturing centre in Canada, its trade greatly benefited by the opening of the *Welland Canal*, constructed to avoid the Niagara Falls. The Welland canal, which was subsequently deepened, enables vessels to reach Lake Ontario from Lake Superior. Using iron-ore, imported cheaply by water, Toronto makes iron and steel goods, including agricultural machinery; and also packs food products and manufactures paper. *Kingston*, with railway works, and *Hamilton* (155,000) with shipyards, have also benefited by the facilities provided by the Welland Canal.

EXERCISES

1. Give *four* reasons which help to explain why the St. Lawrence-Great Lakes Lowlands are the chief manufacturing area in Canada.
2. Describe the farming activities carried on in the St. Lawrence-Great Lakes Lowlands.
3. Select *three* towns in this area. Say why they are important, and in each case draw sketch-maps to show their position.
4. How do you account for the following facts: (a) Hull is an important centre of the lumber industry; (b) Toronto manufactures agricultural machinery; (c) Dairying is widely spread in the St. Lawrence Lowlands; (d) Montreal is the greatest wheat-exporting port in the world?

CHAPTER IX THE FOREST BELT

Lumbering

CANADA's forest belt, which stretches from the Atlantic to the Pacific, has an average width of about 600 miles, and covers an area about half the size of Europe, of which about a quarter is capable of yielding timber for commercial purposes. The trees are mainly coniferous softwoods, such as black and white spruce, red and white pines, and balsam firs. There are magnificent stands of Douglas fir, red cedar, hemlock, and white fir in British Columbia, while in the Maritime Provinces conifers are partly replaced by deciduous hardwoods, such as beeches, oaks, and maples. In the forests of Eastern Canada, which were the first to be exploited, the supply of trees, such as white pine, suitable for sawn timber, is approaching exhaustion. In the past lumber companies denuded the land of timber without any attempt at reforestation, but now they are obliged by law to re-plant areas they have cleared. All the resources of modern science are used to prevent forest fires, which often do incalculable damage. To combat such fires, steel lookout towers, linked by telephone or wireless, have been erected at convenient spots, and aeroplanes are also used for fire detection.

The present output of Eastern Canada consists mainly of spruce and balsam firs, whose logs provide excellent material for the pulp and paper industries. The huge trees of British Columbia yield sawn lumber, beams, planks, poles, and laths, which are used for constructional and general purposes, such as house-building, fencing, and railway sleepers.

Except in British Columbia, lumbering is a winter operation. In Eastern Canada felling commences in autumn and finishes towards the end of the year, when hauling begins. The logs are piled on sleighs, usually drawn by teams of

horses, and transported along the icy drag or *tote-roads*¹ to banking-grounds on or beside the lakes and streams. In some cases the logs are taken to railways, over which they are conveyed to the saw-mills; but in the Canadian Shield area, which is so well served by waterways, rivers are the usual means of transport.

Where several companies operate over the same river, each log is branded on the end with its owner's mark. When the great 'freeze-up' ends, the run of timber down the swollen streams is a grand sight. At bends in the rivers men armed with long spiked poles are stationed on the banks to prevent the logs piling up and causing a jam, but in spite of these precautions jams do occur. Then the lumberjacks speed over the spinning and fast-piling trunks, and, by releasing the key logs, allow the timber to resume its onward rush. Truly the lumberjack plies a dangerous trade. In many cases the lakes are used as collecting-basins in which logs are assembled before being floated down to the saw-mills, where they are caught by booms stretched across the streams. The logs pass up a slipway into the mill, where, according to the type of timber, they are either smashed into wood pulp, or, passing under giant saws, ultimately emerge as a pile of commonplace planks.

Along the Pacific coast of the mainland of British Columbia and in Vancouver Island, the mild climate and the mountainous nature of the country necessitate different methods of logging from those adopted in Eastern Canada. Operations are carried on throughout the year, except for a short time in the height of summer when the dangers of forest fires are great, and during snowy periods in winter. The majority of full-grown trees are from 150 to 250 feet in height, and measure 18 feet or more in circumference. When a tree is selected for felling the axemen cut a deep notch on the side on which it is to fall, and then saw through from the opposite side.

¹ The main hauling roads from which feeder roads branch off.

Meanwhile, at some spot in the felling area, close to the hauling road or railway, a tree has been cleared of branches, topped at a height of anything from 100 to 150 feet, and guyed to keep it firm. This is called a spar tree. Through a pulley fixed near the top is passed a running cable, worked by means of a donkey-engine at the base of the tree. One end of the cable is carried out to the scene of logging operations. The methods of setting up the cable systems vary according to the topography, but at a camp in which the author of this book stayed in Vancouver Island, the spar tree stood in the middle of a valley, and the cable was carried out for nearly 1,000 feet to one side. It was fascinating to see the huge logs, suspended from the cable, travelling through mid-air to the railway, where they were lowered into waiting trucks.

When the logging train was loaded it set off down the valley and ultimately arrived at a lake, where the great logs were pushed off into the water, made up into rafts, and floated down to the saw-mill.

Nearly a quarter of a million men are employed in lumbering operations in Canada. They are of many nationalities. In British Columbia, as well as Canadians, Finns, Scandinavians, and Belgians, a number of Chinese, Hindus, Indians, and half-breeds are employed in the camps; in Eastern Canada many lumbermen are Finns, Poles, and Norwegians. In British Columbia logging is a whole-time occupation. In Eastern Canada it is seasonal, and gives employment to men during autumn and winter when work is suspended on the farms, in the building trades, and on road and railway construction.

Twenty-five years ago Eastern Canada produced about two-thirds of the lumber manufactured in the Dominion, but now British Columbia supplies well over half the amount. About half of the timber is required for home consumption. The remainder is exported mainly to the United States and the British Isles, that from British Columbia

being shipped to the Atlantic seaboard of the States, and to England, via the Panama Canal.

Trapping

For centuries hunting animals for their furs has been a winter occupation in the forests. To-day the skin of the musk-rat is one of the chief pelts obtained from Canada. These pelts are used in making up the cheaper kinds of furs, and though a single skin is worth but little the number collected more than repays the trapper for his trouble. To trading posts, such as those of the Hudson's Bay Company, the trapper also takes the more valuable pelts of the beaver, mink, otter, ermine, and fox. Trapping is carried on in all Canadian provinces, and there are fur farms where the animals are reared for their skins (see p. 49). Montreal, Winnipeg, and Edmonton in Canada, together with New York, St. Louis, and London, are the world's leading fur markets.

Mining in Eastern Canada

Both the Canadian Shield and the Western Cordilleras (see p. 14) are rich in minerals. Canada ranks second to the Union of South Africa in her output of *gold*. Four-fifths of her supply is obtained from Ontario, where the principal mines are in the Porcupine Mountains at Timmins, and at Kirkland Lake. The *copper-nickel* mines near Sudbury, Ontario, in addition to their output of copper, supply 85 per cent. of the world's nickel. *Platinum* and allied metals are found in association with copper-nickel ores: in 1934 Canada produced more platinum than all other countries combined. *Asbestos* is mined at Thetford, 60 miles south of Quebec.

If we were to visit the mining towns in Northern Ontario we should be surprised at their prosperous appearance, their rapid growth, and by the fact that nearly all their inhabitants are quite young. At Kirkland Lake, for instance, so steady

is the increase in the population that each succeeding year it is necessary to provide additional accommodation in the schools.

Lumbering, mining, and trapping are extractive industries. In each Man draws upon the wealth accumulated by

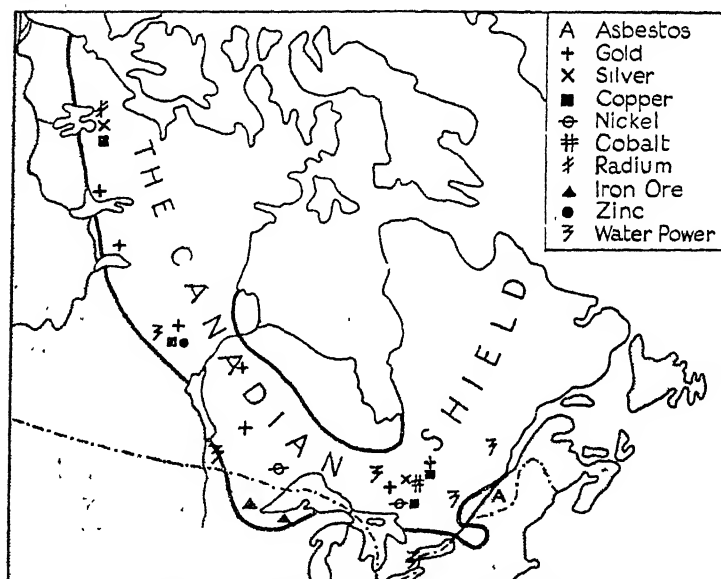


FIG. 21. Canada: Distribution of Minerals

Nature through the ages. But in the case of trapping, given reasonable protection, the supply of animals remains constant; and in lumbering, if reforestation is practised, fresh timber grows in a relatively short space of time. In mining, on the other hand, minerals are won from the depths of the earth which Nature herself can only replace in the course of millions of years. Running water, however, is not a wasting asset. A large waterfall is of more permanent value than the greatest forest, the richest mine, or the deepest petroleum well. It is fortunate that the mining and lumbering areas

are furnished with unlimited supplies of water-power, for, as in the case of the factories, many of Canada's saw, pulp, and paper mills and mines could not be profitably worked without cheap hydro-electric power.

EXERCISES

1. (a) Draw a sketch-map of Canada to show the principal forest areas. (b) Name six important trees found in the forests. (c) Name six ways in which the timber is used. (d) Describe the logging methods adopted in British Columbia, and explain why they differ from those in Eastern Canada.

2. (a) What do you mean by extractive industries? (b) Name three such industries. Give a short account of one extractive industry (apart from lumbering) carried on in the forest belt of Eastern Canada.

CHAPTER X

THE PRAIRIE PROVINCES

The Wide-spreading Prairies

THE Canadian prairies extend from Manitoba through Saskatchewan into Alberta. But though these three political divisions are known as the Prairie Provinces, their northern portions lie within the forest belt. There are few trees on the prairies, but the valleys are often lightly wooded, and along their northern margin is a park-like belt of widely scattered trees and grass.

From the Red River Valley the prairies rise by three steps, margined by low escarpments, to the foot-hills of the Rockies. The first step, called the Manitoba Lowland, is some 800 feet above sea-level. It includes the Red River Valley, part of the bed of a former lake whose alluvial soils are noted for their fertility. The second step, a more undulating region, stretches from the west of Manitoba into Saskatchewan, where it rises on the west to 1,600 feet. The third step, which has a still more diversified surface, spreads through Alberta to the foot-hills of the Rockies, where it reaches an elevation of 3,000 feet. These natural grasslands resemble one enormous farm, for, except in the east, fences are few, and only an occasional homestead, a prairie town, a small village, or the elevators beside the railway lines break the monotony of the landscape.

Practically the whole of the prairie plain slopes east or north-east to the edge of the Canadian Shield. It is drained, therefore, by long rivers following these directions either to the Arctic or Hudson Bay. In the north-west the Peace River and the Athabasca flow into the Mackenzie, greatest of the Arctic rivers. The Saskatchewan and the Red River enter Lake Winnipeg, whose waters are carried to Hudson Bay by the Nelson. The rivers flow across the prairie plains in trough-like valleys, several miles wide and as much as

300 feet deep. The size of such valleys indicates that at one time the volume of the streams was much greater than it is to-day. Frozen in winter, the rivers are navigable in summer, though actually they are little used for transport, partly on account of their winding courses and unsuitable outlets, but mainly because the railways provide a more reliable and an all-the-year-round service. Some rivers are used for irrigation. Even more important is their developed and potential hydro-electric power. There are power stations on the Bow River, a tributary of the Saskatchewan; on the Churchill River; and on the Winnipeg River, the last-named furnishing power for seven plants, including Winnipeg Hydro, a publicly owned undertaking which supplies the City of Winnipeg with electricity at remarkably low rates (see Plate IV).

The Grain Lands

The heavy black soil rich in the humus that predominates on the prairies; the winter snows which moisten the ground; the moderate rainfall and copious sunshine; the level or rolling country which permits the use of large-scale machinery; and the building of railways on which crops are hauled long distances to ports of export, are the factors which have combined to make the prairies one of the leading cereal-growing areas in the world. Wheat, oats, and barley are the chief grain crops, and of them wheat takes pride of place. Wheat is the principal crop in Saskatchewan and Alberta. Oats and barley are equally important in Manitoba, the first province to be opened up, where mixed has replaced one-crop farming, and the growing of cereals and roots is combined with the raising of dairy and beef cattle and poultry keeping. Winter wheat is grown in south-west Alberta, where the Chinook (see p. 68) raises the temperature, and the winters are shorter and less severe than elsewhere. With this exception wheat is sown in spring.

Little wheat is cultivated in the extreme west owing to

the low rainfall, or on the northern marginal lands where the summers are too cool and the growing season too short, on account of frosts which occur in late spring and early fall (autumn). For many years experiments have been made by government cerealists with a view to breeding types of

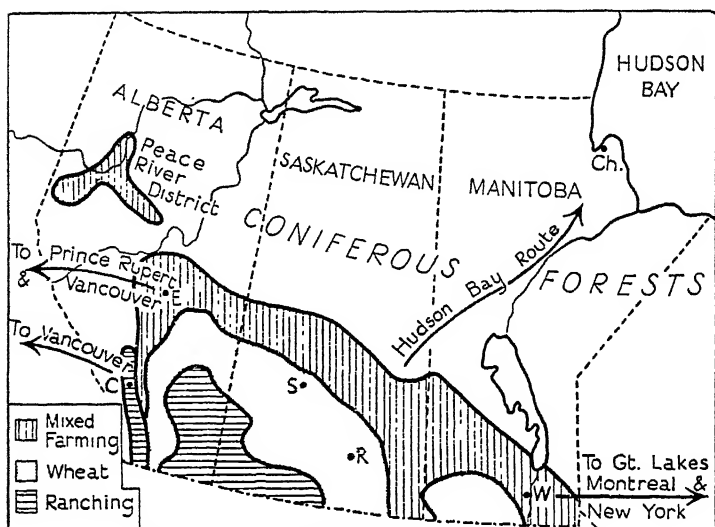


FIG. 22. Canada: Agriculture on the Prairies

wheat suitable for a dry climate, and which will mature in a relatively short time. Ordinary wheat requires a growing season of about four months free from severe frosts. But types have been bred which ripen in shorter periods, and thus the wheat belt is being steadily pushed northward, notably in the Peace River district in Alberta.

The chief difficulties encountered by the grain farmer are due to droughts often accompanied by plagues of grasshoppers, early fall frosts, local hailstorms, and rust disease. On the prairies ploughing starts soon after the melting snows of spring have moistened the ground. The seeds, already chemically treated to prevent rust and other diseases,

are sown by means of large drills drawn by horses or tractors. This operation is carried out between the middle of April and the beginning of May. The ground is then harrowed, a process which lessens evaporation and so conserves the moisture in the soil. The showers of late spring and early summer, together with the brilliant sunshine, cause the wheat to grow rapidly, and within a couple of weeks it is often six inches high. The crops usually head out by the middle of July and within a month are ready for harvesting.

They ripen almost in a night and then from early morning till daylight fades the rhythm of self-binders being driven through the grain is heard on every side. The self-binders cut a swath of from 6 to 8 feet, tying the grain into sheaves which are stacked by men in stooks to dry. Still more modern machines called combines, which cut and thresh the grain in one operation, are also used. The grain is delivered from the combine through a spout at the top into a large hopper. When full, this hopper is emptied into trucks or wagons which take the grain to the elevator.

At the *country elevators* the grain is sucked up by machinery into storage bins. When it is required the spout at the bottom of the building is opened and the grain flows down a chute into a box-car (truck) beneath. All wheat is graded. As the bulk of the prairie grain moves east the work of grading is concentrated at Winnipeg. When a train arrives from the west, government inspectors take samples from each box-car. They insert into the grain a long brass tube, divided into compartments that can be opened and shut at will, and in this way obtain a fair sample of the entire contents of the car. The samples are sent to laboratories at the Winnipeg Grain Exchange where they are tested. The results are telephoned to Fort William, where the grade in each box-car is known even before the train arrives, and soon the grain is stored in huge terminal elevators until it can be shipped eastward.

The size of the wheat crop varies from year to year, but it is usually between 300 and 400 million bushels. In the record year of 1928 it was 567 million bushels, of which two-thirds was exported.

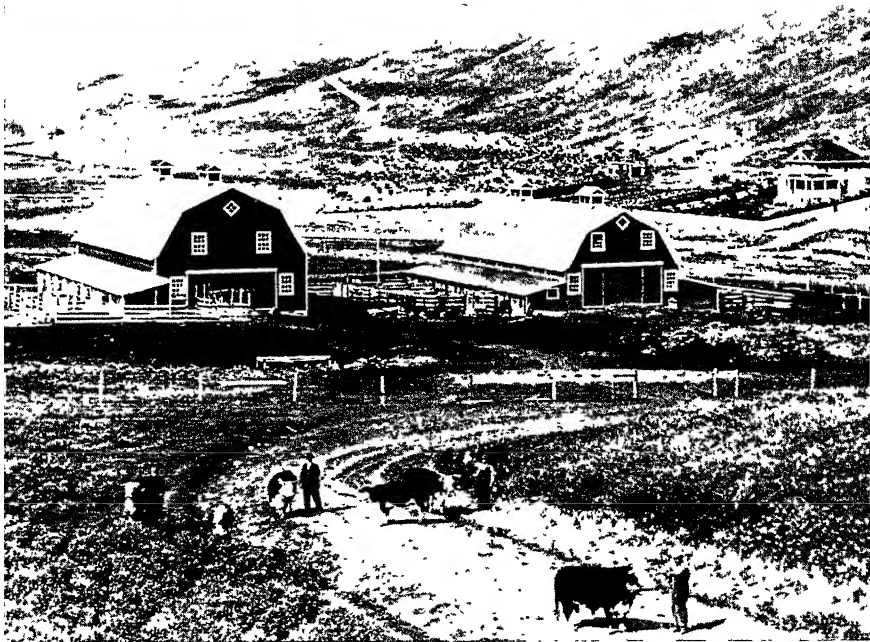
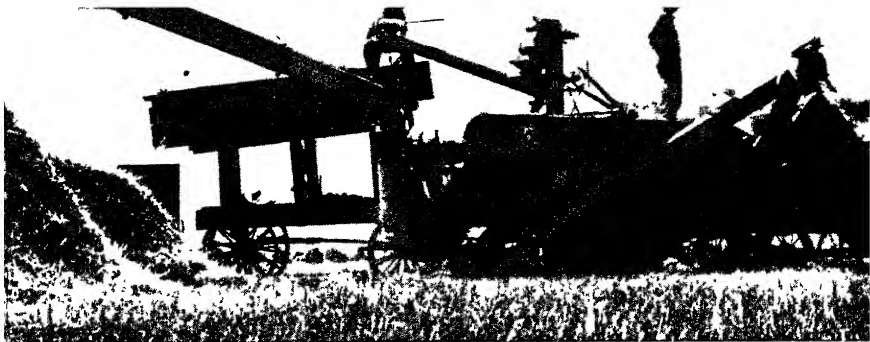
The wheat is dispatched by the *Great Lakes*, through *Pacific ports*, and by way of *Hudson Bay*. By far the greater part passes through Fort William and Port Arthur. From these ports it is shipped by the Great Lakes: (a) direct to Montreal; (b) to Georgian Bay (Lake Huron) and thence by rail to Montreal; (c) to Buffalo, at the head of Lake Erie, and by rail to New York; and (d) to Prescott, at the head of Lake Ontario, and by rail to Montreal. Some wheat is sent direct by rail to Montreal.

Much grain from the western prairies is dispatched to Vancouver, and some to New Westminster and Prince Rupert, from which ports it is shipped to Europe via the Panama Canal. The advantages of this route are (a) ice-free ports, and (b) a shorter rail haul than eastwards. The disadvantage is a longer ocean route to Europe. A certain amount of Saskatchewan wheat is exported through Churchill on Hudson Bay. The rail haul is short; the sea route to the British Isles is 1,000 miles less than that from Montreal, but shipments are only possible for a few months during summer.

Oats and barley, though not such important exports, follow the same routes as wheat.

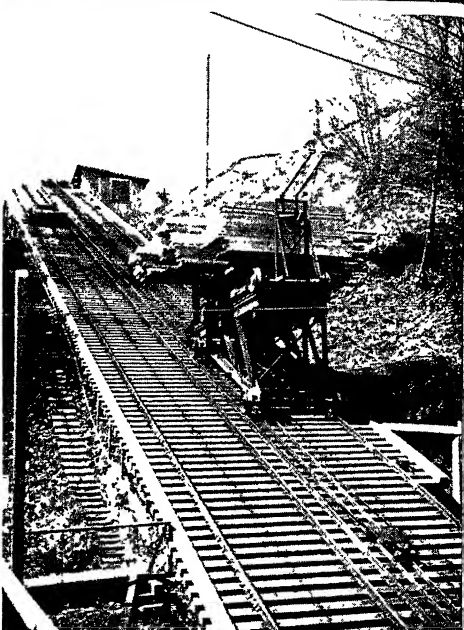
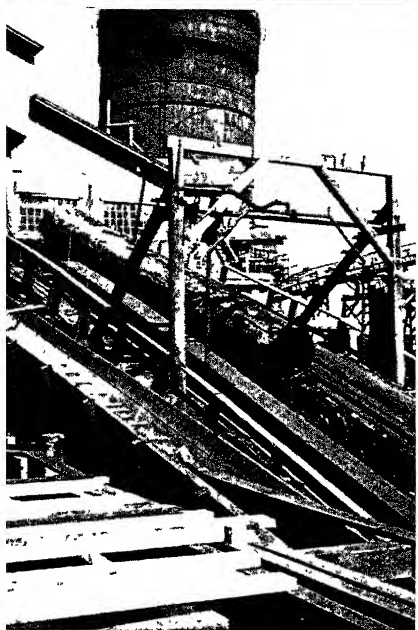
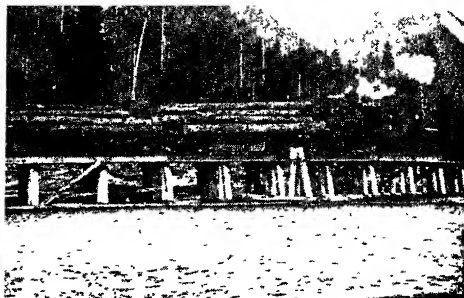
Farming in the West

In the north of Saskatchewan, where the growing season is too short for grain, and in parts of Alberta where the rainfall is insufficient, many horses, beef and dairy cattle, and pigs are bred. In Southern Alberta conditions are specially favourable for ranching (see Plate V). This is due partly to the excellent grazing-ground amidst the foot-hills of the Rockies, and also to the *Chinook* winds. These winds deposit most of their moisture on the windward side of the



5. EAST AND WEST ON THE PRAIRIES

(Above) A harvest scene in Saskatchewan. On the right the sheaves are being fed to the threshing machine, whence grain flows into the wagon box (bottom left), and the straw on to the pile that will ultimately be set ablaze. (Below) Typical ranching country in Alberta (see p. 67). The hip-roofed barns allow ample space for storage. The homestead in the background, unlike those on the more exposed parts of the prairies, is surrounded by a garden. Thanks to the warm chinook winds (p. 65) the cattle are able to remain out of doors during most of the winter.



6. LUMBERING IN BRITISH COLUMBIA

The tree, which the lumberjacks are under-cutting, will be taken with others by rail to the lake-side, where the logs are thrown into the water, made up into rafts, and then conveyed to the mill. Here they travel up the slipway into the mill, pass under a giant saw, and ultimately emerge as a pile of planks.

Rockies. The dry air passes over the mountain crests, and on descending the leeward side is so greatly heated by compression that temperatures rise with great rapidity. In autumn the Chinook turns the standing grass into 'prairie hay'; in winter it melts the snow, and so makes the pasture available for stock which are able to remain out of doors at this season.

On irrigated lands round Calgary, Lethbridge, and Medicine Hat, flax for linseed, and sugar-beet are widely cultivated, as well as alfalfa for fattening cattle.

Mineral Resources

The prairie provinces are not so rich in minerals as Eastern Canada or British Columbia. In Manitoba copper, zinc and gold are won from the Flin Flon mines, which obtain their power from falls on the Churchill River. Gold-fields, in the Canadian Shield area of Northern Saskatchewan, is another gold-mining centre. Alberta has by far the greatest mineral resources. Lignite (brown coal) is mined round Lethbridge, Edmonton, and Calgary; bituminous coal near the Crow's Nest Pass. The Turner Valley Oil-field, near Calgary, which has been rapidly developed in recent years, is the largest crude-oil-field in the British Empire. Associated with it is natural gas, which is also obtained near Medicine Hat and at other centres.

The Romance of the Prairies

It is only necessary to walk along the broad streets of Winnipeg or Edmonton to realize that in no part of the Dominion are racial origins more varied than in the prairie provinces. In Winnipeg alone twenty-two newspapers are published in as many foreign languages, and in a well-known High School in the city there were, in 1939, pupils of twenty-four different national origins. Alberta, the last of the prairie provinces to be settled, is still a land of pioneers. Of its 730,000 inhabitants (1939) somewhat over

half are of British stock (including those born in Canada and the United States), and of the rest nearly all hailed from Continental Europe, among them 55,000 from the steppes of the Ukraine, a region whose natural environment resembles that of the prairies. Some of the older inhabitants wish to preserve their own traditions and language. For many of them 'the Old Country' is not Britain but probably some state in Central Europe. In numbers of villages the people belong mainly to one race—German, Polish, French, and so on. But nearly all are proud of their status as Canadians, which is not surprising, as after all Canada is the land of their choice.

Most of the young people we see on the farms or in the towns are taller than average Britishers, or for that matter than those living in Eastern Canada. Strapping young men over 6 feet are an everyday sight. The splendid physique of the younger generation may be attributed to good feeding, but even more to the remarkably bracing and sunny climate of the prairies.

Many Central European people make excellent pioneer settlers, willing to trek north and carve their homes out of the virgin forest. On arriving at their allotted sections these *homesteaders*, as they are called, must first fell timber and build a cabin, and clear the ground of stumps, before they are able to sow their crops. Thus the homesteader is kept busy until harvest, when, if he is fortunate, he has sufficient money to buy enough 'grub-stakes' (food-supplies) to last his family through the winter.

Even on the more developed parts of the prairies the farms are isolated, though the life is not so lonely as formerly, for nearly everyone has a telephone and a radio.

When the prairies began to be settled the land was divided up into townships each with an area of 36 square miles. These townships were subdivided into sections of 640 acres, which in their turn were split up into quarter sections of 160 acres (see Fig. 23). In each township certain sections

were set aside for the Hudson's Bay Company as compensation for surrendering their original rights in this region. Others were ear-marked for school purposes, these being sold and the proceeds devoted to education. A number were

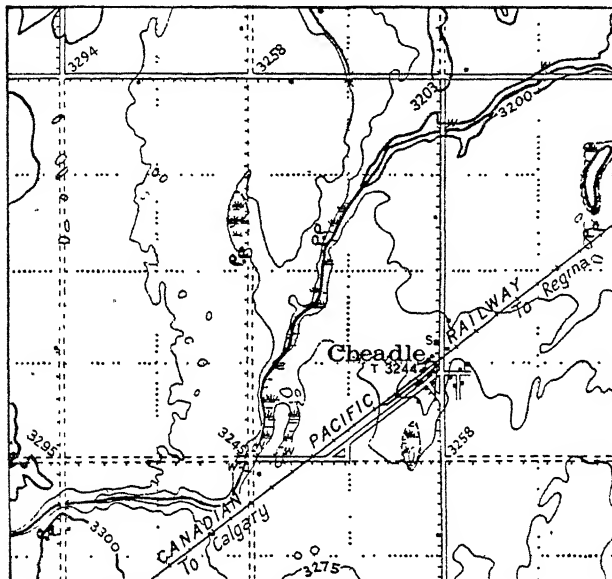


FIG. 23. Canada: Section of the Prairies
Reproduced with the sanction of the Surveyor-General,
Ottawa, Canada

allotted to the Canadian Pacific Railway in recognition of the part played by the line in enabling the West to be opened up.

The railway was built not so much to meet the needs of the scattered settlers already on the prairies as to encourage others to enter. Though climate and soil were ideal for grain-production it was little use growing it without adequate transport facilities. For hundreds of miles the track was pushed west from Eastern Canada, through forests and swampy muskeg, by lakes and streams, until at last it

reached Manitoba, which then received a great influx of settlers. With the continuation of the Canadian Pacific to British Columbia and the subsequent building of the Canadian National Railway and of subsidiary lines, the tide of immigration grew stronger and stronger. The grasslands were brought under the plough, the buffalo disappeared, the Indian gave way to the white man, the prosperity of the West was assured, and Canada became the great granary of the British Empire.

How closely settlement is linked with railway development is shown by the fact that even to-day the most densely peopled belts lie within 10 miles of the lines. In the prairie provinces the number of persons per square mile varies from 1 to 3. As agriculture is the main industry the population is predominantly rural. About two-thirds of the people live on farms, or in villages set at widely spaced intervals along the railways, each with its wooden houses, elevator, store, school, and church.

The towns are collecting-centres for agricultural produce and distributors of manufactured goods. Founded by pioneers beside the rivers, their subsequent growth has been due to the fact that they have become railway junctions. Thus *Winnipeg* (220,000) owes its prosperity to the building of the railways, which pass through the gap between the Lake of the Woods—crossed by the international boundary—and Lake Winnipeg. Capital of Manitoba, and fourth largest town in Canada, it ranks with Chicago as the greatest grain market in the world. Its main industries, closely associated with farming, are flour milling, meat canning, and the manufacture of agricultural machinery. *Regina*, capital of Saskatchewan, head-quarters of the famous 'Mounties', and a junction on the main line of the Canadian Pacific Railway, has direct communication with all the chief towns in the west. One line runs north to *Saskatoon*, on the South Saskatchewan River, here flowing north in a broad trench much too large for the present stream, even in spring

when it is swollen by melting snow and ice. No visitor to Saskatoon can fail to observe that while most of the houses are built of wood, and the larger hotels, office blocks, and churches of brick, the University is constructed of stone, an unusual building-material on the prairies where alluvial soils predominate. Yet this is just an interesting example of the way in which the work of Nature in past ages influences the life of Man to-day, for the stone required for the University was quarried from erratics transported by the ice sheets (see p. 15). Similarly, clay deposited by the ice sheets is used for making pottery, bricks, and sewer-pipes at *Medicine Hat* (Alberta), where natural gas provides cheap fuel; and heavy clays, found some 40 miles south of *Moose Jaw*, furnish material for lining fire-boxes (of railway engines), which require frequent renewals.

Calgary, lying in a cup-shaped depression drained by the Bow River, lies in the heart of the ranching country—the legendary 'Wild West'. Half a century ago it was merely an outpost of the Mounted Police and a ranchers' rendezvous. Now it is the second city in Alberta. Power is obtained from plants on the Bow River, and natural gas is piped to the city principally from the Turner Valley Oil-field. Its industries include meat packing, flour milling, and oil refining. Westward the Canadian Pacific Railway follows the Bow Valley, passes through the Kicking Horse Pass, and enters the valley of the Kicking Horse River.

Edmonton (85,000), the capital of Alberta, standing near the junction of the prairie and the forest, is a fur market, and has flour-milling and meat-packing factories. With its broad streets, so typical of prairie towns, it covers 50 square miles, a reminder of the fact that, owing to the ample amount of land available, the early settlers spread themselves over the prairies instead of concentrating in a small area. It is the airport for the North-West Territories and Yukon. The Canadian National Railway passes through the city, and lines run north-west to the rapidly developing

Peace River District, and to Waterways, the railhead on the Clearwater, a few miles from its confluence with the Athabasca.

EXERCISES

1. Give an account of cereal production in the prairies under the following heads: Relief, Soils, Climate, Seasons; Methods of Sowing, Harrowing, and Harvesting; and Transport to (i) Railway, and (ii) Ports of Shipment.

2. How do you account for the location of the following industries at the towns named: (a) flour milling at Winnipeg; (b) the collection and sale of furs at Edmonton; (c) oil refining and meat packing at Calgary; (d) pottery and brick making at Medicine Hat?

3. Write an account of the natural resources of Alberta. Compare them with those of Manitoba and account for the differences.

CHAPTER XI
THE NORTHLAND: THE NORTH-WEST
TERRITORIES AND YUKON

Canada's Arctic Heritage

THE region extending from Hudson Bay westward to the Rockies is divided into the North-West Territories and Yukon, whose combined area is nearly $1\frac{1}{2}$ million square miles, but whose population is scarcely 15,000. Many people, judging by these figures, imagine that the Far North is a desolate waste perpetually covered with ice and snow. Certainly in winter temperatures are far below zero, and rivers and lakes are frozen to a depth of as much as 8 feet; but in summer the weather is warm, and would be delightful if it were not for the myriads of mosquitoes that make life unpleasant for men and animals.

The tundra belt stretches from the Arctic southward towards the forests. That part of it to the west of Hudson Bay was christened *The Barrens* by fur-traders, owing to the treeless nature of the country. In winter the spongy pale-yellow caribou 'moss', looking rather like fungus, is easily foraged by caribou who nose in the fine dry snow. In spring mosses and lichens are bespangled with flowers; in summer they are often hidden by luxuriant grasses and sedges, which, with innumerable shrubs, provide food not only for caribou, but for moose and other animals. There is no marked dividing line between the tundra and the forest, which along the river valleys sends out tongues of woodland almost to the Arctic. For instance, pines, poplars, and silver birch stretch right down the Mackenzie Valley to the huge delta, which is clad with willows from 10 to 15 feet high.

From the early days of the Hudson's Bay Company until recent years the North was inhabited mainly by fur-traders, trappers, and prospectors; Indian, Eskimo, and half-breed hunters; 'Mounties' and missionaries.

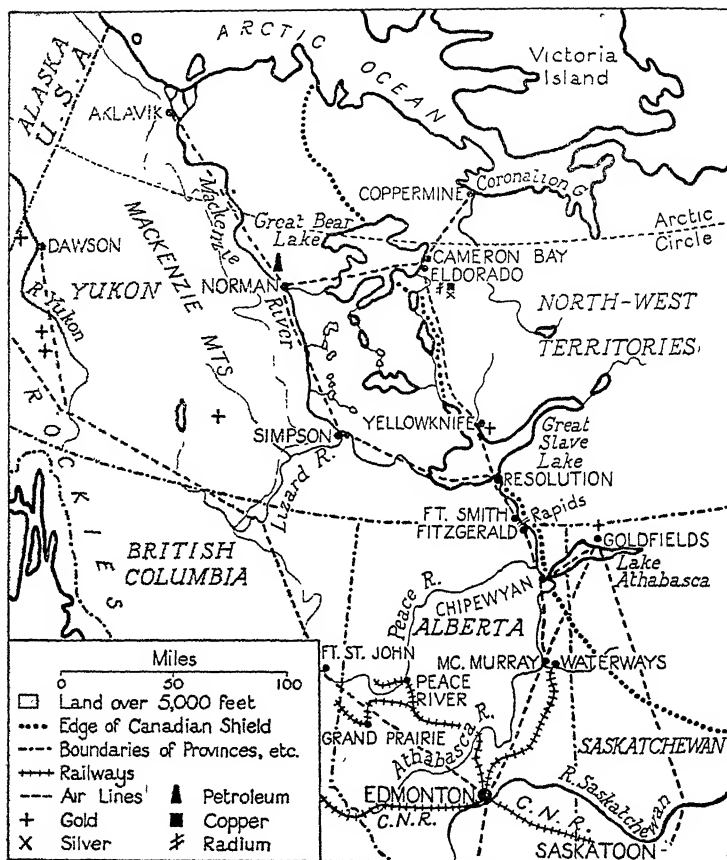


FIG. 24. Canada: North-West Territories and Yukon

Hunting, fishing, and fur-trading are still important occupations. To-day many of the Indians and 'breeds' have outboard motors fitted to their canoes, and some Eskimos own oil-driven schooners. As a race the latter appear to be natural mechanics, possibly because their traditional occupations of hunting and fishing taught them the art of patience. Besides hunting seals and caribou, some Eskimos are now herders of domesticated reindeer, introduced into Canada from Alaska, whose original herds came from the Siberian tundra. They build snow houses when out on winter hunting expeditions, but their ordinary homes consist of log cabins, which are banked round with snow except during the warmer weather. When early in the present century Dr. Camsell, the famous Canadian explorer and geographer, visited a number of Eskimo tribes near the Great Bear Lake he found they were virtually Stone Age people. To-day these same tribes are relatively civilized. Many send their children away to be educated; the women use sewing machines instead of bone needles, and radios and even typewriters are not unknown. The Western Eskimos, such as those round Aklavik, numbers of whom have some Scottish blood in their veins, are a finer type than those to the west of Hudson Bay.

For years prospectors returning from the Far North told of its mineral wealth, but transport difficulties made it impossible to open up this area, whose outposts were nearly 2,000 miles from civilization. It took months to travel from the Prairie Provinces to the Arctic. In winter the only way was to journey by dog team; in summer by canoe.

So matters remained until about 1930, since when, thanks mainly to the aeroplane, the North is being developed. The whole of the country has been mapped from the air, and mineral deposits located, including gold, silver, copper, pitch-blende (radium-yielding) ores, and oil.

There are now regular air services from Edmonton (i) to Coppermine, on Coronation Gulf, an inlet of the Western

Arctic; (ii) down the Mackenzie Valley to Aklavik, situated on one of the tributaries of this mighty river; (iii) to the Peace River District; and (iv) to Dawson, the capital of the Yukon Territory, and thence to Alaska. From Edmonton's airport miners, prospectors, traders, trappers, doctors, the Royal Canadian Mounted Police and other government officials, fly north into the Arctic Lands. Not only are passengers, perishable foods, and light articles conveyed by air, but machinery and other heavy and bulky articles. So great is the quantity carried that Edmonton handles more freight than all other airports in North America combined.

Flying North in Winter

Flying north from Edmonton the traveller gazes down upon a farming district whose rectangular sections make it look like some gigantic chessboard. The aeroplane follows the broad Athabasca River, flowing between high wooded banks, to Fort McMurray, a few miles from Waterways, the 'end of steel'. In winter planes are fitted with skis so that they can land on the frozen surfaces of the rivers and lakes. From July to September steamers ply between Waterways and Fitzgerald where, owing to rapids on the Slave River, goods are sent by motor truck to Fort Smith, sixteen miles distant, at the base of the rapids. Beyond this village the Slave and Mackenzie Rivers are navigable to the Arctic.

North of Fort McMurray the farming areas are left behind and the traveller flies over forest and spongy muskeg. An occasional trapper's cabin may be seen, and here and there beside the Athabasca are neatly stacked piles of timber, ready to be used as fuel by steamers in summer. After skirting Lake Athabasca the plane follows the Slave River to Fort Smith. Away to the west is the Wood Buffalo Park where buffaloes, with heads down, may be glimpsed galloping over the snow. Fort Resolution stands where the Slave River enters the Great Slave Lake. This little settlement, with its wooden houses, Mission Station, and Hudson's

Bay Post, is much like half a dozen others scattered throughout the North-West Territories. Separated by several hundreds of miles of uninhabited country from their nearest neighbours, such outposts formerly received their mail once a year; now, owing to the aeroplane and the radio, they are kept in daily touch with each other and the outside world.

Most of the country margining the Great Slave Lake is low-lying. It is highest round Yellowknife, which stands on the north-east side of the lake. Built on solid rock, this gold-mining centre only came into being in 1937. Yet within two years it had grown into a progressive little township with stores, including one belonging to the Hudson's Bay Company, cafés where most of the inhabitants take their meals, a church, a post office, two hotels, a bank—the only one in the North-West Territories—a radio station, the sub-stations of the Trans-Canada and the Mackenzie Air Lines, Barracks of the Royal Canadian Mounted Police, and several large mines. As gold is obtained in quartz veins instead of placer sands, it is too expensive for a prospector to work himself, and so when he strikes a lucky find he sells his claim to companies who put up the necessary capital.

From Yellowknife the flight continues across wild and desolate country to Great Bear Lake. The marvel of the aeroplane, one of the latest triumphs of engineering, soaring over the Canadian Shield, composed of some of the oldest rocks (pre-Cambrian) in the world, cannot fail to strike even the least imaginative traveller. In winter the low bulging hills, dotted with pines and carpeted with snow, and the frozen lakes linked by streams flowing hither and thither, present an unforgettable sight. Three-quarters of this area consists of water, and only the fact that the lakes and streams are devoid of trees enables us to distinguish them from the land. Occasional herds of caribou may be seen, but there is no trace of human habitation. Some two hours after leaving Yellowknife we see the mountains rising along the eastern

shore of the Great Bear Lake, and soon the plane swoops down through a narrow wooded valley on to this inland sea, twice as large as Wales, which lies athwart the Arctic Circle.

A few miles south of Cameron Bay, on the east side of the lake, is Eldorado. It was at this point in 1930 that silver, copper, and pitch-blende (radium-yielding) ores were located. Now Eldorado is the greatest radium-producing mine in the world. The tunnels, which are driven into the solid rock, do not need shoring up as they do in a coal mine, and, owing to the absence of gas, safety lamps are unnecessary. As far down as the 250-foot level the ground is permanently frozen, but at the 800-foot level the temperature remains at 44° F. throughout the year: in summer this level appears cool, but in winter it is pleasantly warm compared with the surface, where the temperature may be as much as 50° below zero. The ores, first concentrated in a mill at the mine so as to reduce the bulk, are dispatched to refineries at Port Hope, Ontario. In winter sacks of concentrates are carried by powerful freight planes. In summer they are taken by scows down the Great Bear River to Norman, on the Mackenzie, whence they are shipped by steamer to the rail-head of Waterways, 1,500 miles distant. Down-stream from Norman are oil wells, whence oil is piped to Eldorado, and also to Whitehorse on the Alcan Highway, which runs from Edmonton to Fairbanks, Alaska.

Speeding north-east from Cameron Bay the aeroplane passes over the Coppermine Country, and then drops down to the trading settlement of Coppermine, on Coronation Gulf. But unless he were told the visitor would scarcely realize that he had reached the Arctic, for both land and sea are deep in snow. From 10th December until 13th January the sun does not appear above the horizon. Only a greenish gloom prevails, and as there are no shadows a man may stumble into a snow-drift without knowing it.

It is no exaggeration to say that but for the aeroplane the Far North would not have been opened up. Some of the

mining centres will undoubtedly grow in size, but it is improbable that this vast region will ever support more than a scanty population; yet so rich are its mineral resources that it is bound to contribute an ever-increasing amount to the wealth of the Dominion. In former days the young man sought his fortune in the West; now he seeks it in the North-land—Canada's Arctic Heritage.

EXERCISES

1. With the aid of your atlas describe a journey by rail and river from Edmonton to Aklavik. What is the distance? During what months would it be possible to undertake such a journey? Name the probable cargoes carried (i) down-stream, and (ii) up-stream.

2. (a) Describe the main forms of transport used in the Far North. (b) Which has played the greatest part in its development? Why?

Note: Pitch-blende is a compound containing *uranium*, which is a radio-active element (i.e. it emits rays, or streams of particles), thus gradually disintegrating and changing its structure. At any given moment a uranium ore will always contain radium since part of the ore will have reached that particular stage of disintegration. The name *radium* is derived from the Latin *radius*, a ray. Radium is man's chief weapon in the fight against that terrible disease cancer, but it is employed for many other purposes, such as the manufacture of luminous paint used on the dials of watches and clocks. Uranium is a source of *atomic energy*, which has already proved its frightful effectiveness in war, but may soon be harnessed for peaceful purposes.

CHAPTER XII BRITISH COLUMBIA AND THE WESTERN CORDILLERAS

Configuration and Climate

THE coast-line of British Columbia is indented by steep-sided fiords and fringed by rugged islands. The intervening channel provides an ocean passage where ships are sheltered from the winds and storms of the open Pacific. The province is traversed from south to north by the ranges of the Western Cordilleras, between whose parallel folds lie plateaux and longitudinal valleys, overlooked by giant peaks, snow-fields, and glaciers. With the exception of the Colorado, the chief Pacific rivers of North America rise in British Columbia. The Columbia flows for 600 miles through the province before entering the United States; while the shorter Fraser and Skeena rivers, whose valleys are followed by trans-continental railways, lie wholly in Canadian territory. Though navigable for short distances, the chief value of these and other streams lies in their falls and rapids, which furnish developed or potential power. Some, too, are used for irrigation.

Owing to the prevailing west and south-west winds the coastal belt of British Columbia has an insular climate very like that of the British Isles. Summer temperatures are similar to those of the south of England, the winters are mild, and there is rainfall throughout the year. In the interior the climate is more of the continental type though not so extreme as the prairies. The summers are hotter and the winters colder than along the coast, and the rainfall is less, though heavy snowfalls in winter ensure abundant moisture in spring.

We may divide British Columbia into two regions: (1) the Western Cordilleras, and (2) the Pacific Fiorded Coastal Region.

(1) *The Western Cordilleras* of British Columbia are a region of infinite variety. Their rugged peaks and snow-clad ranges present a striking contrast to the luxuriant coniferous forests clothing their lower slopes; to the intermont plateaux with their pastures; and to the irrigated valleys.

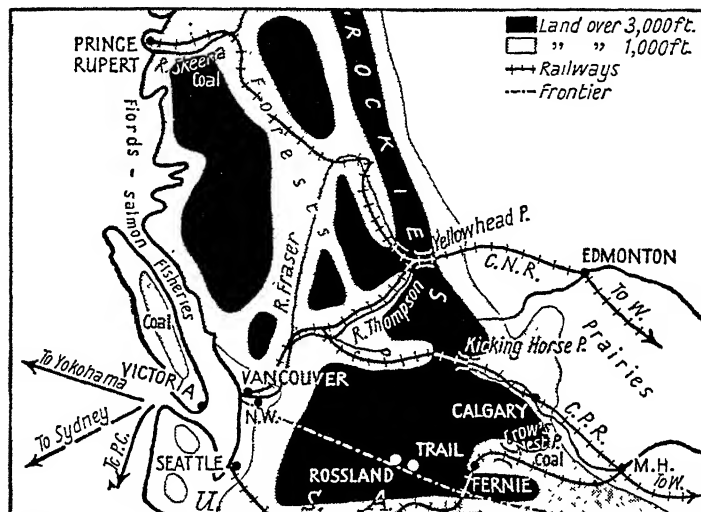


FIG. 25. British Columbia: Routes across the Rockies

The environment is reflected in the occupations of the sparse population, who are concerned mainly with lumbering, mining, and farming.

Her splendid forests are one of British Columbia's greatest assets. As most of the finest trees in Eastern Canada have been felled, the Douglas firs, spruces, red cedars, and other gigantic conifers found in the western Province are one of the chief sources of timber required for constructional purposes. Smaller trees growing at higher levels are used for wood pulp. In some districts rivers provide transport for logs as well as power for electricity, though in many areas, owing to the rapidity of the streams

and the numerous falls, timber is hauled to the saw-mills by light railways, or motor tractors. In the interior logging is a winter operation. Along the coast, where the mild and humid climate produces exceptionally fine stands of timber, it is carried on throughout the year, except when heavy snowfalls occur in winter, and during the height of summer when the fire hazard is great (see p. 59).

British Columbia ranks next to Ontario as the chief mining province in Canada. *Coal*, the most important mineral, includes lignite and bituminous varieties and anthracite, the chief mining areas being at Fernie, west of the Crow's Nest Pass, and near Nanaimo, on the south-west coast of Vancouver Island. About half the coal is exported to the United States, either by rail from Fernie or by water from Nanaimo. Gold, silver, lead, zinc, and copper are mined. At Britannia Beach, north of Vancouver, is an important mine that produces copper, gold, silver, and zinc. Placer and lode mining are carried on in a number of districts, in many of which operations have revived recently owing to the increased price of gold. Small amounts of nickel are produced. The principal mining region is in the south. The ores are concentrated locally, and then sent to *Trail*, in the Columbia Valley, where there are huge smelters, refineries, and metallurgical works, supplied with coal from Fernie and electric power from plants on the Kootenay River. Important by-products include sulphuric acid and fertilizers (see Plate 3).

Only about 10 per cent. of the province consists of arable land, which is found mainly in the south, hay, oats, wheat, and potatoes being the chief crops. Mixed farming is carried on in the lower valleys, where the rearing of dairy cattle, pigs, and poultry is combined with the growing of vegetables and fruit. The Kootenay and Okanagan Valleys are famous for their apple orchards, irrigated by means of water carried through flumes.¹ In still more southerly dis-

¹ Artificial channel for a stream of water.

tricts the mild climate enables peaches and grapes to be grown.

(2) In the *Pacific Fiorded Coastal Region* the life of the people is intimately bound up with the sea. Fishing is the principal occupation; most of the towns and scattered villages lie along the seaboard; and it is by water that transport is carried on, for the coast is too deeply indented and mountainous to allow roads and railways to be built along it, except for short local stretches.

The salmon fisheries of British Columbia, together with those of Alaska to the north and the adjacent coastal area in the United States to the south, are the most valuable of their kind in the world. Some of the catch is sold in fresh or frozen form, some is salted, smoked, or pickled, but the greater part is canned.

Salmon are born in fresh water, but spend their mature life in the sea, returning to the rivers for spawning. It is during these homeward migrations that the incoming fish are caught in the estuaries and lower reaches of the streams. After they have been captured motor-boats carry them with the utmost speed to canneries, usually situated at convenient spots on the rivers, often near some isolated Indian village. Before long the fish are unloaded into bins whence they are fed to an 'Iron Chink'—so-called because it does the work formerly performed by Chinese workers—where they are cut up ready for the actual canning. The fishing season ends in autumn when the annual runs of salmon cease, and then the Canadian, Japanese, and Indian workers return to their homes. Deep-sea fishing, of which Prince Rupert is the chief centre, has become important in recent years. Unlike salmon fishing it can be carried on throughout the year.

Peoples

Its climate has played no small part in making British Columbia a favoured province with settlers from the Old

Country, and the majority of the people are of British stock. But the position of this province, fronting as it does the Pacific Ocean, accounts for the presence of Chinese and Japanese minorities, though now their immigration into Canada is virtually prohibited. Like the Eskimos of the Arctic and (with certain exceptions) the Indians, these Asiatics are not enfranchised, and socially remain apart from the rest of the population. Of the 760,000 inhabitants of British Columbia, 90 per cent. have their homes in the coastal region, and nearly half live in Greater Vancouver and the surrounding district.

Vancouver (250,000), the third largest city in Canada, stands on Burrard Inlet, a magnificent ice-free harbour slightly to the north of the delta of the Fraser, whose valley is followed by the Canadian Pacific and a branch of the Canadian National Railways, for both of which the city is the Pacific terminus. It is the chief entrepôt port of British Columbia. With a growing export trade in wheat, timber, fruit, and fish, Vancouver has shipping connexions with the United States, Europe via the Panama Canal, Eastern Asia, South Africa, and Australia. Like *New Westminster*, a few miles up the Fraser river, it has saw and pulp mills and salmon canneries. *Victoria* (40,000), the provincial capital, situated in the extreme south-east of Vancouver Island, is an administrative and residential rather than an important shipping and business centre. *Prince Rupert* is one of the two Pacific termini of the Canadian National Railway, which reaches the port by way of the Skeena Valley. Though it is a leading fishing port, its hinterland is not nearly so productive as that of Vancouver, and it is doubtful if it will ever be more than a town of moderate size.

EXERCISES

1. Draw a full-page map of British Columbia. Shade the high land. Insert and name Vancouver Island, Queen Charlotte Island, and the rivers and towns mentioned in this chapter. Print Lumbering, Coal, Salmon each over *one* appropriate area.

2. (a) Draw a sketch-map to show the importance of Vancouver. (b) Name and account for (i) its chief industries, and (ii) its principal exports. (c) How do you account for the fact that it is a much larger city than Victoria?

3. Name *four* important industries carried on in British Columbia. Show how two of them have been influenced by geographical conditions.

CHAPTER XIII CANADA—TRANSPORT AND TRADE

Inland Waterways

WATER transport has always been of great importance to Canada. In many areas the rivers and lakes are used not only for carrying timber long distances, but for local traffic. Of them all, by far the most useful are the St. Lawrence and the Great Lakes, which together form the chief inland waterway in the world. This great highway, leading from the head of Lake Superior for 2,400 miles to the Atlantic, is of enormous value both to Canada and the United States. It affords an outlet for their raw materials, and besides serving the principal industrial area in the Dominion it also serves an equally important region on the opposite side of the frontier. Lake Michigan lies wholly in the United States, while for the last 1,000 miles the St. Lawrence flows through Canadian territory. Apart from these stretches, the control of the St. Lawrence-Great Lakes waterway is shared equally by Canada and the United States. In both countries rivers and canals provide important subsidiary routes.

As the lakes lie at different levels—the surface of Lake Superior is about 350 feet above that of Lake Ontario—their waters spill from one to the other by falls and rapids which are avoided by canals. Of the three canals cut to avoid the Sault Ste Marie rapids between Lake Superior and Lakes Huron and Michigan, the largest and most used is in the United States. The bulk of the traffic consists of iron-ore from Lake Superior to ports in the States on Lake Michigan and Lake Erie, and prairie grain travelling east. Coal is the chief return cargo. The traffic passing through the Sault, or Soo, Canals exceeds that of the Panama and Suez Canals combined. The Welland Canal, 30 feet deep, which was cut to avoid the Niagara Falls, allows large

upper-lake vessels to travel from Fort William and other ports on Lake Superior right through to those on Lake Ontario. But only vessels of moderate draught can proceed down the upper St. Lawrence to Montreal, for the canals constructed to avoid the various rapids in this part of the river have a depth of only 14 feet. Freighters specially designed to carry heavy and bulky cargoes, like grain, iron-ore, and coal, are used on the Great Lakes, while at the ports modern labour-saving machinery allows these commodities to be unloaded and loaded with remarkable rapidity. In one hour, for example, 30,000 bushels of wheat can be poured from a terminal elevator at Fort William into the hold of any vessel. In the same time, 10,000 tons of iron-ore can be shipped at Duluth (U.S.A.), or 3,000 tons of coal dumped into a collier loading at Cleveland (U.S.A.). The reduction in time and labour costs resulting from these methods, coupled with the long distances over which freights are carried, lowers transport rates considerably. A ton of wheat can be sent by water from Fort William to Kingston at a cost of about 5 cents ($2\frac{1}{2}d.$) per 100 miles.

The Ottawa River, the most important of the tributary streams, is navigable to Ottawa, which is also linked with Lake Ontario by the Rideau Canal. The canalized Richelieu River and Lake Champlain, together with a canal, link the St. Lawrence with the Hudson and New York; the New York Barge Canal System (formerly called the Erie Canal), of the United States, joins the Hudson to Lake Erie. But relatively little traffic now uses these subsidiary waterways, and the quantity of goods carried over them is negligible compared with the volume of trade on the St. Lawrence-Great Lakes.

Unfortunately the St. Lawrence is blocked with ice for about five months every year, and in winter the Great Lakes are frozen around their shores. Thus at this season all goods must be conveyed by rail. Another disadvantage is due to the frequent fogs near the mouth of the St. Lawrence

which are a hindrance to shipping. But in spite of these drawbacks the St. Lawrence-Great Lakes carries more traffic than any other inland waterway.

Railways

To-day there are 42,000 miles of railway in Canada. In a country like Great Britain lines are built mainly for economic reasons. In the Dominion they were also constructed with a view to promoting national unity. The main object of building the Canadian Pacific Railway (C.P.R.) was to provide an essential link between British Columbia and Eastern Canada, and to open up the prairies to settlement. The extension of the railway net and the building of that other great trans-continental line, the Canadian National Railway, very greatly assisted the development of the prairies and the West.

Canada is a land of great distances and it takes about five days to travel by rail from the Atlantic to the Pacific seaboard. The *Canadian Pacific Railway* runs from the ice-free port of Saint John (N.B.) to Montreal. Thence it goes up the Ottawa Valley to Ottawa. For some thirty hours the traveller speeds through forests broken here and there by clearings, over viaducts, through cuttings and tunnels, and along embankments, until at last he reaches Port Arthur-Fort William, on Lake Superior, where the giant elevators along the waterfront give him a hint of the great wheat lands that lie ahead. Then after some 280 miles he emerges from the forests and enters the prairies, where, here and there, trees, singly or in groups, dot the landscape for some distance. Crossing the Red River the train steams into Winnipeg. So past gaunt country elevators and the little towns of the wheat lands the train rumbles on, through Brandon to Regina, which is reached some ten hours after leaving Winnipeg. Calgary, in the ranching country, is left behind, and the line continues up the valley of the Bow River towards the Rockies and, passing through the Gap,

reaches Banff, set amidst magnificent forest and mountain scenery, in the centre of the Banff National Park.

The line climbs upwards and, crossing the Great Divide, passes through the Kicking Horse Pass. It then descends 100 feet, by two remarkable spiral tunnels, to the valley of the Kicking Horse River, which it follows to that of the Columbia. Leaving the latter at the famous 'Big Bend', the railroad climbs the Selkirks, tunnels through their crest, and begins its descent to the Pacific. Running through canyons it follows the valley of the Thompson River to that of the Fraser, and so past New Westminster to Vancouver.

The *Canadian National Railway* (C.N.R.) runs from Halifax through Nova Scotia and New Brunswick, crossing the St. Lawrence by a great bridge which spans the river at Quebec. Thence, following a more northerly route than the C.P.R., it runs through the forests and so on to Winnipeg. Here it strikes north-westward and passing through Saskatoon, on the Saskatchewan river, reaches Edmonton. Crossing Northern Alberta it climbs up to the Yellowhead Pass in the Rockies. It then divides. One branch runs south-west to Kamloops and by way of the lower Fraser valley to Vancouver. The other follows the upper Fraser valley, and continues through mountainous forested country to the Skeena valley, which it descends to the Pacific port of Prince Rupert. Numerous branch lines connect the Canadian National and the Canadian Pacific Railways, while the latter is linked with the United States systems.

Air Transport

The importance of air transport in a country so vast as Canada can scarcely be overestimated. The *Trans-Canada Air Service*, connecting Montreal with Vancouver, was inaugurated on April 1st, 1939, and subsequently extended eastward to Moncton (N.B.), with connexions to Halifax, Saint John, and Charlottetown (P.E.I.). The aeroplanes,

which carry mail, express packages, and passengers, have revolutionized the long-distance mail services, and, except in urgent cases, have done away with the necessity of sending telegrams, which in Canada are charged according to mileage. For instance, a letter posted in Montreal, in time to catch the aeroplane leaving in the evening, reaches Vancouver during the following afternoon, and a reply sent by return mail is received by the original sender in less than two days after he posted his letter. But a communication leaving Montreal by train about the same time as the air-mail letter does not arrive at Vancouver until four days later.

Travellers by air get a wonderful bird's-eye view of the Dominion. After leaving Montreal the aeroplane follows the valley of the Ottawa River to Ottawa and, in little more than an hour, reaches North Bay, in the heart of a mining area, where passengers change into the plane from Toronto. Continuing over forested country they reach Kapuskasing, with its great pulp-mill. Several hours pass; then trees grow fewer, and before long Winnipeg airport is reached. After refuelling the liner speeds over the prairies to Regina, and so to Lethbridge, the junction for Calgary, Edmonton, and the North-West. The plane begins to climb, making for the *Crow's Nest Pass*, the lowest route over the Rockies, whose jagged peaks and snow-clad ranges present a striking contrast to the deep forested valleys. The Okanagan Valley, flanked by miles of orchards and woods, is left behind, and the aeroplane follows the ever-widening Fraser Valley to Vancouver, which is reached after a journey of 2,400 miles, accomplished according to the schedule in just over fifteen hours. As a matter of fact the aeroplane takes about eighteen because, owing to difference in longitude, Vancouver time is three hours earlier than Montreal time.

In addition to Trans-Canada and other lines serving populous centres, there are a number, such as the *Mack-*

zie Air Lines, which provide fast and reliable services to sparsely peopled areas where mining is important.

The Canadian lines have connexions with the vast aerial network of the United States, and with trans-Atlantic and trans-Pacific services. The shortest route across the Atlantic is the Great Circle Route from Foynes (Eire) to Port Botwood, Newfoundland. And because Canada lies nearer the North Pole than the United States the most direct routes from Britain to the Far East cross the Dominion. Montreal, for instance, is nearer to the Pacific than New York, which on a map appears to be almost the same distance away from the western seaboard. Compare the relative positions of Moscow and San Francisco on a map and on a globe. The globe shows that the most direct route between these two places is the Great Circle Route, passing over the polar regions, and thence by way of Edmonton, Alberta.

On a flat surface the straight line joining any two points is the shortest distance between them, but on a globe all lines are curved. Such curves, when produced in either direction, form circles. If we cut a globe right through its centre, it will be divided into two equal portions, and the mark made by the cutting line will be the largest possible circle that can be drawn upon the surface. Such a circle is called a *Great Circle*. All great circles on the globe are the same size. Lesser circles, called *Small Circles*, whose planes do not pass through the centre of the globe, can also be drawn upon its surface. The Equator is that Great Circle, drawn midway between the Poles, which divides the Earth into two equal parts, called Hemispheres. All other parallels of latitude are small circles. If we examine a globe we shall see, however, that all meridians of longitude are half Great Circles. *The shortest distance between any two places is the route following the arc of the Great Circle passing through them.*

Thus both long-distance aircraft and steamers, where

possible, follow the arc of a great circle, that is of a circle of which the centre of the Earth is the centre. It is for this reason that Trans-Pacific and Trans-Atlantic aircraft follow Great Circle routes.

Trade

The St. Lawrence-Great Lakes waterway by providing cheap transport, especially for bulky and heavy raw materials, has done much to stimulate Canada's trade. Likewise, if the east and west of the Dominion had not been linked by rail, and the prairie provinces served by additional branch lines, Canada would not be nearly so important industrially and commercially as she is to-day. The development of water-power has very effectively fostered her manufactures, and at the present time she ranks second only to the United Kingdom as the chief industrial country in the British Commonwealth. Owing to the relatively small population of the Dominion, the home market, both for primary and manufactured products, is small and the country must, of necessity, depend largely on external markets to take her surplus commodities. Hence, Canada's export trade per head is one of the largest in the world, and the variety of her exports is in itself a striking indication of her natural resources.

They fall into four groups, which are given here in order according to their total value.

(1) *Food products*, dependent on agriculture and fisheries, include unmanufactured foods, such as wheat and fruit, and prepared foods, like wheat-flour, rye whisky, cheese, and fish (mainly tinned salmon). Meat falls into both subdivisions: part is exported as tinned or frozen meat, and part in the form of cattle, many of which are sent to Birkenhead or to Glasgow. (2) *Forest products*, including semi-raw materials such as wood pulp, planks, and boards, and manufactured goods like paper, especially newsprint paper whose value much exceeds that of timber and wood pulp combined.

(3) *Minerals*, which are exported mainly in semi-manufactured form, e.g. copper bars. The chief in order of value are gold, nickel, copper, aluminium, zinc, lead, asbestos,

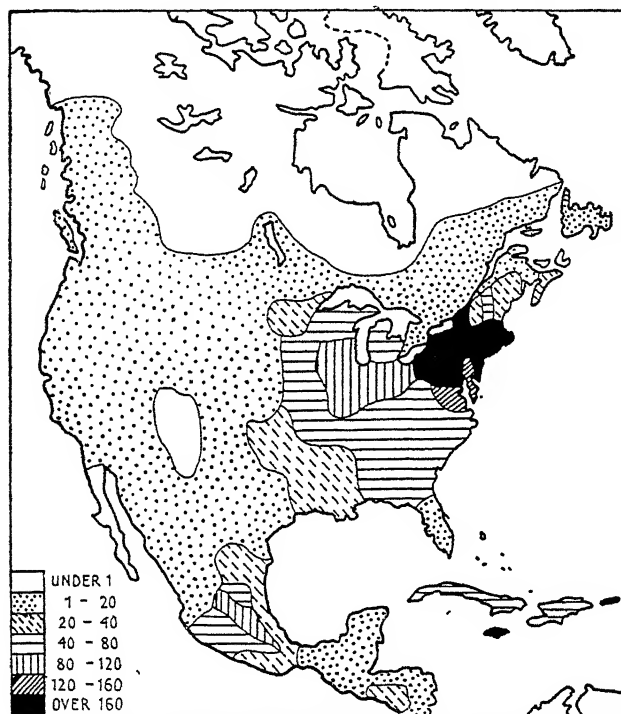


FIG. 26. North America: Distribution of Population per sq. ml.

silver; platinum and radium, of both of which Canada is the world's largest producer. (4) *Wholly manufactured goods* include motor-cars, machinery, and paper (see 2).

These exports reflect clearly the main occupations of the Dominion—agriculture and fisheries, lumbering and allied industries, mining and manufacturing. The last is being rapidly developed, and it is the aim of the government to foster it, and with increased use of hydro-electric power and

a growing population it seems inevitable that it will steadily grow in importance.

Imports. The imports of Canada show the influence of a number of factors, among which may be noted (*a*) her position in temperate latitudes; (*b*) her present relative lack of coal, iron, and petroleum; (*c*) her membership of the British Commonwealth of Nations; and (*d*) her proximity to the

FOREIGN TRADE OF CANADA			
EXPORTS		IMPORTS	
Wheat & Wheat Flour		Coal	
Wood & Paper Products		Petroleum	
Meat & Fish		Rolling Mill Products	
Nickel		Fruits	
Motor Vehicles		Raw Cotton	
Copper Bars		Sugar	

FIG. 27

CANADA: FOREIGN TRADE BY COUNTRIES			
EXPORTS TO:		IMPORTS FROM:	
	United States		
	United Kingdom		
	All other countries		

FIG. 28

United States. As the Dominion lies chiefly in temperate latitudes it imports tropical and sub-tropical products. Of these the chief are raw cotton, which comes mainly from the United States; rubber from British Malaya; sugar-cane from British Guiana; and bananas from the British possessions in the West Indies. Mineral imports include iron-ore from the United States and Newfoundland, and petroleum, the bulk of which comes from the former country. Iron and steel goods, as well as coal, are obtained mainly from the United States and Great Britain: British coal may be regarded as a return cargo for bulky commodities like wheat. Other Canadian imports from Britain include textile goods.

The United States and Great Britain are the Dominion's best customers. As regards imports, Canada purchases from the United States goods whose value is somewhat more than two and a half times those supplied by Britain.

Thus, while the balance of trade between the United States and Canada is about equal, the Dominion is in a very favourable position as regards Britain.

EXERCISES

1. (a) Draw a sketch-map of the Great Lakes and the St. Lawrence. Name each of the Lakes and mark the position of rapids and falls. Insert and name the canals constructed to avoid them. On your map mark and name *six* important Canadian towns on the Lakes, *two* on the St. Lawrence, and *three* (each on a different lake) in the United States. (b) Discuss the advantages and disadvantages of this waterway. (c) Name three of the chief commodities carried by lake steamers and explain why transport rates are so low.

2. Describe a journey across Canada *either* by rail from Prince Rupert to Halifax, *or* by air from Vancouver to Saint John. Illustrate your answer by a sketch-map.

3. What do you understand by the term 'Great Circle'? What is the practical importance of Great Circle Routes? Give examples.

4. Name *six* of the chief exports of Canada. What can you learn from them about the Dominion's natural resources? How do you account for the fact that Canada has so large an export trade per head?

CHAPTER XIV

THE GROWTH OF THE UNITED STATES

Westward Expansion

THE area of the United States, excluding Alaska and the overseas territories, is slightly under 3 million square miles. But though the Republic is smaller than Canada it has twelve times as many inhabitants. Its growth and development has been truly remarkable. When in 1776 the thirteen English colonies along the Atlantic coast declared their independence, the newly born United States had a population of only 3 millions. Since that date, by colonization and conquest, by annexation and purchase, the American people have extended their dominion right across the continent and have also acquired overseas possessions.

It was not long before the young Republic began to receive immigrants from Britain and other countries of North-West Europe. Some settled along the seaboard, but others joined the increasing stream of colonists who poured through the Appalachian valleys and spread over the fertile interior plains. Many made their homes in the valley of the Ohio, along whose banks numerous settlements had been established by the beginning of the nineteenth century, and before long the Ohio river was the main route by which colonists sent their produce towards the eastern seaboard. Disputes had frequently arisen between the English pioneers and the French, who, in the seventeenth century, descended to the Mississippi valley and there founded Louisiana. In 1803 this territory was purchased by the United States, whose frontiers were thus pushed right across the fertile plains of the Middle West to the Rockies. Not quite half a century later the old Spanish possessions in the south-west, which by this time had passed to Mexico, were by conquest, annexation, and purchase added to the United States, which thus stretched from the Atlantic to the Pacific.

European Immigration

The lands of the Middle West and the Pacific seaboard, being the homes of scattered settlers and Indian tribes, did not bring a great addition to the population of the United States. The North-East remained, as to-day, the most thickly peopled area, and in this part growth was rapid. Within a hundred years of the Declaration of Independence, the inhabitants of the United States numbered 55 millions. A large proportion were immigrants, or their descendants, who had come mainly from North-West Europe. But during the next half-century the incomers who streamed into the United States came mainly from Italy, Poland, Russia, the Balkans, and other countries of Eastern and Southern Europe. Hence the type of settler changed. But immigration was checked by the War of 1914-18. Since 1923 it has been restricted. Each European country is now assigned its quota. Under this system people coming from North-West Europe receive preferential treatment, as their traditions and ways of living conform more closely to those of the average American than do those of the inhabitants of Eastern Europe. From 1820 to 1937, 38 million immigrant settlers, excluding those from Canada and Mexico, entered the United States. In 1937 the total number was only 50,000,¹ of whom somewhat more than one-fifth were Germans.

Most of the inhabitants of the United States are thus of European descent. Though the majority are of British and Irish stock, they include representatives of every country in Europe, more especially of Germany, Italy, Poland, and Russia. Many Canadians have also settled in the United States, while a large number of people of Mexican origin are found in the south-west of the country. Of the 122 million inhabitants of the Republic in 1930, some 95½ millions were native white Americans, 13 millions were of white foreign-born extraction, and nearly 12 millions were

¹ Including those from Canada and Mexico.

negroes. The last, the descendants of freed slaves, live chiefly in the Southern States, but recently large numbers have migrated to New York and other large cities, where their presence raises various social problems. There are about 300,000 Indians most of whom live on reservations; and 212,000 Chinese and Japanese, found mainly along the Pacific coast.

Distribution of Population

The most thickly peopled areas, as we have seen, are in the North-Eastern States. This is due partly to their proximity to the Atlantic and the Great Lakes, and partly to the Pennsylvanian coal-field. Outside the towns, whose industries are based chiefly on agricultural products, the Middle West is populated mainly by farming communities. The Mountain States are thinly peopled. Nevada, in this area and lying in an exceptionally arid region, has only 0·8 persons to the square mile, but even this figure compares favourably with the North-West Territories of Canada, where there are but 0·08 persons—or one-tenth of this number—to the square mile.

The Welding of a Nation

The rise of the United States to a leading place among world powers was due to her unique position, her vast resources, and above all to her people, especially to those early colonists whose qualities of character, grit, and dogged determination laid the foundations of her future greatness. The welding of British and other European strains, continually reinforced by fresh blood from overseas, resulted in the formation of a virile nation.

In so vast a country, and among a people drawn from many European nations, there are bound to be differences in outlook. Those living in the North-Eastern States are most closely in touch with Europe; the people of the Middle West are somewhat more isolated, while the inhabitants of California have their own special problems, due in part to their position opposite Asia. But railways, motor-cars,

and air transport; the telephone, the cinema, the press, and above all the radio, are helping to break down isolation and to create a national outlook. Moreover, schools, churches, societies, and political parties cut across social divisions. They help to lessen class and racial barriers, and to provide that equality of opportunity which is the basis of the American system.

The World Outlook

Separated from Europe by the Atlantic, and from Asia by the Pacific, the United States tries to remain politically aloof from the troubles of the Old World. But in a country where 'Freedom is a Watchword', the sympathies of the people as a whole are with those states which have a democratic form of government. With Canada, the United States is closely linked by racial and material ties. She is also the natural leader and protector of her sister republics in Latin America. 'She strives consistently to develop with them closer political and commercial relations, and is determined to enforce the Monroe Doctrine which, in brief, aims at retaining the Americas for the Americans, free from any outside interference.'¹

The defence of the United States is closely linked with that of Canada. In 1940, with a view to strengthening her position in the Atlantic, the States acquired from Britain the lease of sites for naval bases in Newfoundland, Bermuda, and the West Indies, the last named being especially important for the protection of the Panama Canal.

Regions of the United States

The United States may be divided into a number of regions, each of which is unified by its climate, relief, soil, vegetation and resultant products, and human activities. It should, however, be remembered that these regions merge

¹ J. H. Stembbridge, 'America's Republics as a World Influence', *Daily Telegraph*.

and that there is gradual transition from one to the other. The following are the chief of these regions:

1. The Appalachian Highlands, which may be divided into (a) New England, (b) the Hudson-Mohawk Gap and New York, (c) the Central Appalachians and their margins, (d) the Southern Appalachians and the Piedmont Plateau.

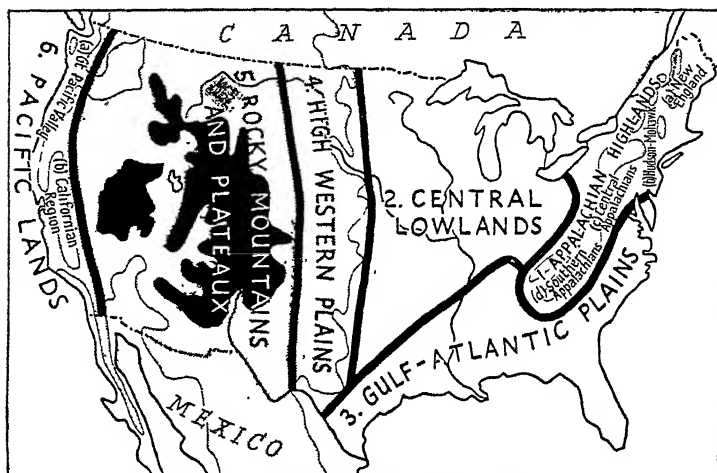
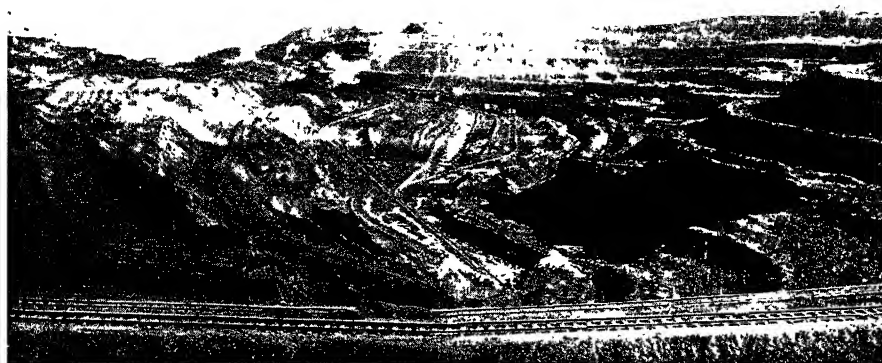


FIG. 29. United States: Chief Regions

2. The Central Lowlands, which merge into
3. The Gulf-Atlantic Plains.
4. The High Western Plains.
5. The Rocky Mountains and Plateaux.
6. The Pacific Lands.

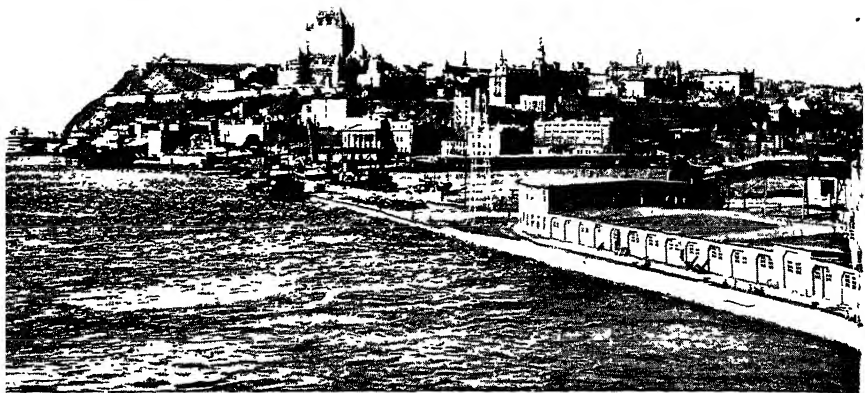
EXERCISES

1. (a) Compare the United States and Canada as regards size and population. (b) In the case of the United States say which area is the most densely populated and give reasons for your answer.
2. Write a short account of the growth of the United States and explain why it expanded from east to west.



7. IRON AND STEEL

(Above) From these open-pit mines in Minnesota mechanical shovels dig iron ore, which is conveyed by rail and water to iron and steel plants (below) on the shores of Lake Michigan. The steamer, with engines aft and crew's quarters 'forrard', has just unloaded coal for the coking plant (foreground), near which are gasometers and benzole tanks. The coke and limestone (in dumps along waterfront) feed the blast furnaces (left background), which supply the steel-works with semi-raw material (see pp. 109 and 120).



8. CONTRASTS IN CITIES

(Above) Quebec, most historic city in North America. Above the Lower Town, fronting the St. Lawrence, rise the walls of the Upper Town, crowned by the Chateau Frontenac, with the Citadel, on the extreme left, standing on the Heights of Abraham. Large ocean liners berth a mile or so upstream (see p. 55). (Below) New York. Manhattan Island is bounded on the west by the East River, on the east by the Hudson. Note the rectangular layout, and the skyscrapers, a modern adjustment to environment (see p. 106).

CHAPTER XV
THE APPALACHIAN HIGHLANDS
Natural Advantages

IN studying a country it is interesting to discover why some areas are so much more important than others; to see why some towns grow to great cities and others remain quite small; and to learn the reasons why some industries increase in importance and others die away. Why is it that the North-Eastern Region of the United States, though occupying a relatively small portion of the country, is by far the most important and populous area? The answer does not, of course, depend upon one but upon a number of factors.

In the North-East of the United States the Appalachians are margined by a coastal plain which decreases in breadth from south to north. From Cape Hatteras northward to the St. Lawrence estuary, owing to the sinking of the coast, the sea has 'drowned' the mouths of the valleys, forming openings from the head of which routes, of varying difficulty, lead to an interior rich in coal and other resources. From Cape Hatteras southward to the Peninsula of Florida the general trend of the Atlantic seaboard is towards the west. Hence the north-east coastal area is nearer to Europe than any other part of the States. This relative proximity to the 'older' continent, coupled with the good harbours and the routes leading inland, was largely responsible for the fact that the north-eastern seaboard was the first to be colonized; while the subsequent opening up of the Pennsylvanian coal-field accounted for its later development.

We may divide Appalachia into (a) New England, (b) the Hudson-Mohawk Gap and New York, (c) the Central Appalachians and their margins, and (d) the Southern Appalachians and the Piedmont Plateau.

New England

In New England a rocky coast, indented by harbours, fringes a narrow plain backed by the forested New England Highlands, which though rugged are not so high as the Central and Southern Appalachians. Chief of the routes leading inland is the Connecticut Valley, separated from the

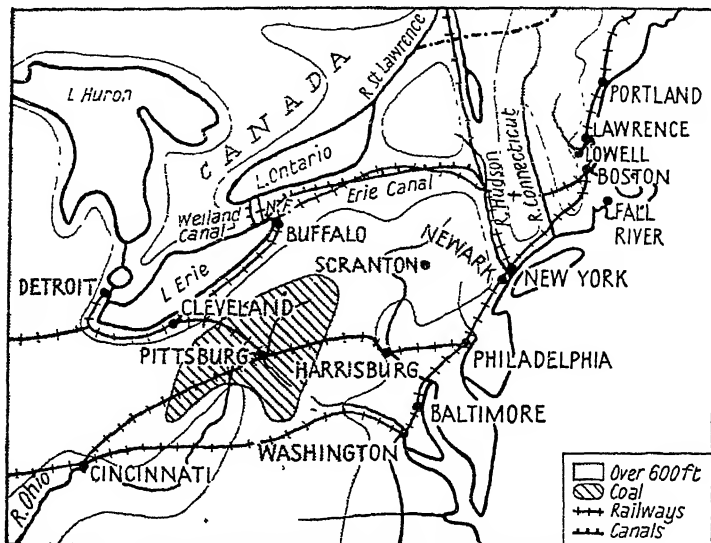


FIG. 30. United States: North-Eastern States

Hudson Valley by the Green Mountains and the Berkshire Hills. In its climate, relief, and natural vegetation, New England resembles the adjacent Maritime Region of Canada. The summers are warm, the winters cold with frequent snow, and rain falls at all seasons.

New England was settled in the seventeenth century by English Puritans. They found, however, that the amount of land suitable for farming was limited. So besides growing food crops, and grazing cattle and sheep, they turned their attention to the sea. The shallow waters covering the sunken coast were rich in fish. (Even to-day the New

England fisheries are among the chief in the United States.) In the forests were plentiful supplies of pine and oak suitable for shipbuilding. Lumbering is still important, especially in the states of Maine, Vermont, and New Hampshire. *Portland*, the capital of Maine, and a terminal port of the Canadian Pacific Railway, has a large export trade in timber.

Present-day farmers are engaged in dairying and truck farming (market gardening) for urban markets. This type of farming pays them better than attempting to compete with the cereal-producing lands of the interior (compare the Maritime Provinces of Canada).

Growing competition from the virgin plains of the west turned the attention of the New Englanders to industry and they invested a considerable amount of their capital in factories. As in Lancashire, the earlier woollen industries paved the way for cotton manufactures, for which the damp climate was suitable, and in whose successful development the inherited skill of the workers counted for much. With the invention of the steam-engine, and the coming of the Industrial Revolution—'the Machine Age'—coal began to replace running water as a means of power. The modern textile centres are situated either at ports where they can obtain cheap water-borne supplies of coal, or within easy reach of falls which can be harnessed to provide hydro-electric power. *Manchester* and *Lowell*, both on the river Merimac, are important cotton-manufacturing centres. So, too, are the ports of Fall River, *New Bedford*, and *Providence*, the capital of Rhode Island, which is also noted for woollen manufactures. *Fall River* is especially well favoured, for a fall of 130 feet in half a mile furnishes power, while the harbour is deep enough for the largest vessels. The New England factories specialize in fine cotton goods, which need less raw material (thus reducing transport costs), but more skilled labour than the coarse cottons manufactured in the South Atlantic states where the raw material is close at hand. Other industries where skilled labour is more

important than raw materials include the manufacture of watches at *Waterbury*, and light metal goods at *Hartford* and other places on the Connecticut River. In the Connecticut Valley there are also towns engaged in manufacturing paper from local and imported wood pulp, while boots and shoes are made round Boston.

Boston (780,000) is the chief port, largest town, and principal commercial and industrial centre in New England. It imports large quantities of raw cotton, wool, hides, and coal. Its export trade is not so great, partly because the bulk of the manufactured goods of New England are sold in the home market. The port is served by numerous railways. Those to the west are all difficult, for they have to tunnel through the ridges bounding the Connecticut valley. From this valley a railway tunnels for $4\frac{1}{2}$ miles, through the Hoosac Mountains, to the Hudson valley, whence the line follows the Mohawk to Lake Erie and the interior. Near Boston is Harvard University, while *New Haven* is the home of the equally famous University of Yale.

The Hudson-Mohawk Gap and New York

The Dutch pioneers who founded New Amsterdam on Manhattan Island at the mouth of the Hudson, and the English who gave the settlement its present name of *New York*, little thought that this small trading post would become the second largest city in the world. New York has long since spread from Manhattan Island across the Hudson and East Rivers (Plate 8), and on to Long Island, but about a third of its inhabitants still live on Manhattan Island itself where there are, on an average, over 200,000 people to the square mile. In so densely populated and confined a space, land is extremely expensive, with the result that in the business quarters huge skyscrapers have been erected, some of which are 1,100 feet high. Its splendid ice-free and sheltered harbour, which extends up the Hudson and East Rivers, has a total water frontage—incredible as it may seem—of some-

what more than 900 miles, of which more than a third has been developed for shipping. Forty per cent. of the foreign trade of the United States passes through New York, and

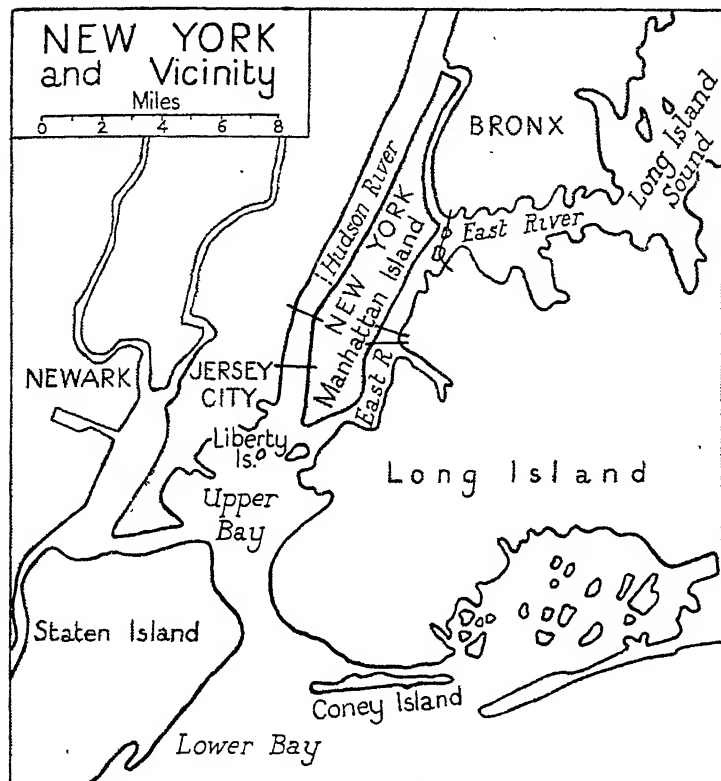


FIG. 31. United States: Site of New York

each day throughout the year one ship, on an average, enters the harbour every twenty minutes.

New York owes much of its importance to the fact that the Hudson-Mohawk valley is the only lowland route in the United States leading from the Atlantic seaboard to the interior. The Hudson valley leads to Lake Champlain and

the St. Lawrence at Montreal. The valley of the Mohawk river, which enters the Hudson at Albany, runs west to Lake Erie. New England and the coastlands to the south are to no small extent tributary to New York, but it is by way of the Hudson-Mohawk valleys that the great city is linked with a vast hinterland which includes the Pennsylvanian industrial area, the region served by the Great Lakes, and the interior plains to the south. It is not surprising that with its marvellous harbour, its command of one of the most important routes in North America, and its rich hinterland, New York has become the chief port, the leading banking and commercial centre, and one of the principal manufacturing areas in the United States; and with a population of 7 millions the second largest city in the world. Its industries, too numerous to specify in detail, include the manufacture of clothing, furniture, and tobacco.

✓ The Central Appalachians and their Margins

✓ This region extends from the Atlantic coast-lands to the Pennsylvanian industrial area which, though separated by the Appalachians from the ports and towns of the seaboard, is closely linked with them by industrial and commercial ties. Of the routes connecting the two areas, the most important is that by way of the Hudson-Mohawk valleys. Others, more difficult, follow the valleys of the Delaware; the Susquehanna, which leads to the Harrisburg Gap and thence to Pittsburg; the Potomac which gives access to the Cumberland Gap; and that of the James River. All these routes are traversed by railways. But with the exception of the Hudson-Mohawk, they are handicapped by very steep gradients which add to transport costs. \

Western Pennsylvania and the adjacent state of Ohio have as their waterfronts lakes Erie and Ontario, on the north, and the river Ohio, on the south. The lakes form an artery of incalculable value, but the Ohio is less important and traffic on the river is now small, owing to rail and road competition.

The United States produces about one-third of the world's coal. Of this amount more than half is obtained from the *Appalachian coal-field* which stretches from Pennsylvania along the Appalachians to Alabama. It includes the *Pennsylvanian* and *West Virginian* fields. As throughout most of this region the rivers have cut deep valleys into the horizontal Coal Measures, galleries can be run into the mines from the sides of the valleys, making it unnecessary to sink deep shafts. Much of the coal is of a bituminous (soft) type, which is easily worked by machinery and cokes well. Anthracite is found in north-east Pennsylvania round Scranton and Harrisburg. In this area, however, owing to the folding of the rocks, the seams lie far below the surface and deep shafts have to be sunk to obtain the anthracite. Though vast quantities of coal are required for the local industries, especially for smelting iron-ore, much is shipped from Cleveland and Buffalo on Lake Erie, while West Virginian coal is sent by rail to Newport News and Norfolk for export by sea.

The presence in relative proximity of coal, iron-ore, and limestone did much to make the Pennsylvanian area one of the foremost iron-smelting districts in the world. Local supplies of iron-ore are now almost exhausted and the bulk comes from open-pit mines in Minnesota (see p. 120 and Plate 7), whence it is shipped from Duluth by the Great Lakes. The leading iron-smelting centres are Cleveland and Buffalo, on Lake Erie, whose blast furnaces are supplied with coal from the Pennsylvanian coal-field.

From Cleveland ore is dispatched by rail to *Pittsburg*, which is still the largest steel-manufacturing centre in a country whose output of pig-iron and steel exceeds that of any other. Thus Pittsburg is an interesting example of *geographical inertia*, the tendency of established industries to remain where they are long after the conditions which gave rise to them have changed. In addition to a great variety of iron and steel goods, Pittsburg manufactures glass.

for which cheap fuel and suitable sands from the Ohio valley are available; and also corks, chemical and electrical apparatus. At Pittsburg two rivers unite to form the Ohio, and a number of tributary valleys converging on the city have helped to make it a focus of roads and railways. *Scranton*, in eastern Pennsylvania, is another important steel-manufacturing centre. So, too, are the lake ports of Cleveland and Buffalo. *Cleveland*—like many towns in populous areas with a market close at hand—manufactures clothes. It also refines oil, though the output of the Appalachian oil-fields, the first in the United States to be opened up, is now relatively small. *Buffalo* imports prairie grain. The bulk is dispatched to New York by rail, though some is transported by the New York Barge Canal which, like the railway, follows the Mohawk and Hudson valleys. Like other cities in New York State, Buffalo obtains its electric power from the Niagara Falls.

Philadelphia (2,000,000), the third biggest city in the United States, stands near the head of navigation on the Delaware, 120 miles from the Atlantic. As the chief seaport for Pittsburg and the Pennsylvanian coal-field, it has a large export trade in coal and steel; and its close connexion with the latter area is further emphasized by its foundries, ship-yards, and railway works. Petroleum is piped for hundreds of miles to its refineries. It also exports grain from the Middle West. To its copper-refineries concentrates are sent from the western mining states, the Keweenaw Peninsula, and from Chile and Peru (via the Panama Canal). *Trenton*, somewhat farther up the Delaware, uses clays found in the valley for the manufacture of pottery.

Baltimore (820,000) stands at the head of the northern arm of Chesapeake Bay. Both its exports and industries resemble those of Philadelphia. On the Potomac arm of the Bay stands *Washington*, a beautiful city, administrative and residential rather than commercial. After the Declaration of Independence this site was selected for the Federal

Capital to avoid jealousy between larger towns. Washington is the seat of the Government, containing the Capitol, where the House of Representatives and the Senate meet; the White House, the official residence of the President; and the Government offices. Near the mouth of Chesapeake Bay are the coal-exporting ports of *Norfolk* and *Newport News*. *Richmond*, at the head of the James River estuary, exports tobacco from Virginia.

The Southern Appalachians and the Piedmont Plateau

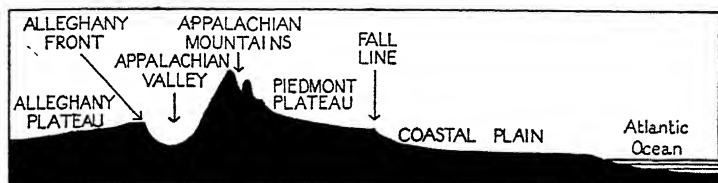


FIG. 32. United States: Section across the Southern Appalachians

From the Hudson into Alabama the Appalachians, from east to west, form four well-defined regions: (a) the Piedmont Plateau, whose junction with the lower coastal plain to the east is marked by rapids and waterfalls, where the rivers descend from higher to lower levels (the *Fall Line*); (b) the main Appalachian ridges, whose rock layers have been folded and contorted; (c) the Appalachian Valley, which broadens out towards the Gulf Plains; and (d) the Alleghany Plateau, whose rock layers are almost horizontal, and which presents a steep face (Alleghany Front) to the Appalachian Valley.

On the southern slopes of the Appalachians lies the Alabama Coal-field, where the presence of iron ore and limestone gave rise to the iron and steel industries of *Birmingham*. The Piedmont Plateau produces tobacco and cotton (see p. 117).

In recent decades cotton manufacture has greatly increased in the South Atlantic States, notably at such *Fall Line* towns as Montgomery, Columbus, Columbia, and

Augusta, which grew up at the foot of the scarp that marked the head of navigation on the rivers. The southern mills actually consume more cotton than those of New England, but the goods they produce are coarser and



FIG. 33. United States: The Southern Appalachians and the Piedmont Plateau

heavier than those of the north-eastern manufacturing area, which, partly because of the higher transport cost of their raw material, specialize in high quality goods. Cheap hydro-electric power has stimulated manufacture at the Fall Line towns, but in spite of the low cost of electricity many factories still use coal. Timber from the Appalachians and the plain is made into furniture at *Macon* and *Augusta*; *Columbus* manufactures agricultural machinery, obtaining its iron and steel for this purpose from the Birmingham district.

EXERCISES

1. (a) Give *three* reasons which help to explain why New England is an important cotton-manufacturing area. (b) Account for the type of cotton goods in which New England factories mainly specialize. (c) Name one other cotton-manufacturing area in the United States.
2. Illustrating your answer from New York, describe *three* important conditions necessary for the development of a large commercial port.
3. (a) Compare the positions of Boston and Philadelphia as regards (i) Atlantic trade routes, and (ii) their respective hinterlands. (b) Account for the fact that the import trade of Boston is more important than its export trade, while in the case of Philadelphia the conditions are reversed.
4. What do you understand by *geographical inertia*? Illustrate your answer from Pittsburg.

CHAPTER XVI

THE CENTRAL LOWLANDS AND THE GULF-ATLANTIC COASTAL PLAINS

The Land and the People

THE Central Lowlands of the United States, which extend from the international frontier to the Gulf of Mexico, lie in the basin of the Mississippi. Towards the south-east they merge into the Atlantic Coast Plain. Westward they rise gradually to the High Plains at the base of the Rockies. The glacial debris which covers the northern portion of the plain, owing to its wide range of origin, forms fertile soils rich in mineral foods on which plants thrive. In the south the soils are more varied. As the region is level or gently undulating, the main divisions depend on climate rather than on relief and soils. The summers are hot, but in the north the winters are so cold that the rivers and lakes freeze, and the ground is blanketed with snow, which in spring provides the necessary moisture for the soil. The rainfall is moderate. It is greatest in the south-east, which receives most rain in summer, when, owing to the low pressure, the winds blow on-shore. The amount decreases towards the west; and beyond longitude 100° W. irrigation is necessary for crops unless dry-farming is practised.

Coal, petroleum, and falls provide power for industries associated with the forests and farming. Thus *Saginaw* and *Grand Falls* (Michigan) both manufacture furniture with local and imported timber; St. Louis makes boots and shoes; Cincinnati packs pork; many towns mill flour. But the primary business of this region is agriculture. Though mixed farming is carried on, more especially in the north, most of the land is devoted to the large-scale production of wheat, maize, or cotton for which the level nature of the plain and the similarity of climate over large areas is extremely favourable.

The Wheat and Maize Belts

Wheat is sown in spring in the north; in autumn farther south. The *spring-wheat belt* extends from the Middle

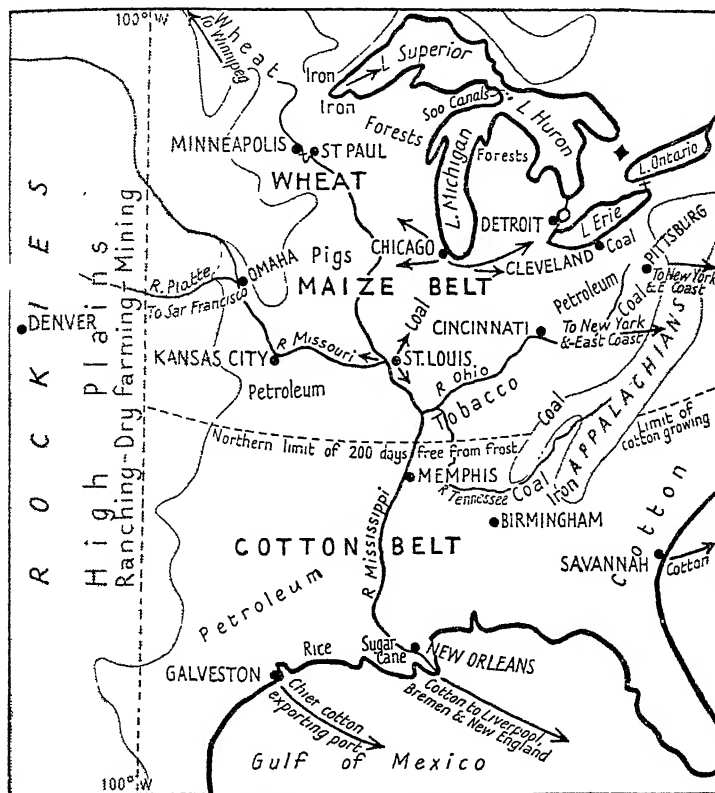


FIG. 34. United States: The Mississippi Basin

Mississippi north-west, across the international frontier, into Manitoba. Besides wheat, crops include oats, barley, fodders, such as hay and roots, fruit, and flax, from whose seeds linseed oil is manufactured. On the rolling pastures horses and beef cattle are grazed, while in the cooler, damper

region nearer the Great Lakes (the Hay and Mixed Farming Belt) thousands of dairy cattle are reared for milk, butter, and cheese which are marketed in the urban areas. The woodlands furnish timber for building the big red or white barns where fodder is stored and stock sheltered in the cold winter months, and for constructing the farm-houses, often set amidst orchards or surrounded by clumps of sheltering trees. The chief seats of the flour-milling industry are the twin cities of *St. Paul* and *Minneapolis*, on the Mississippi, whose mills derive power from the St. Anthony Falls.

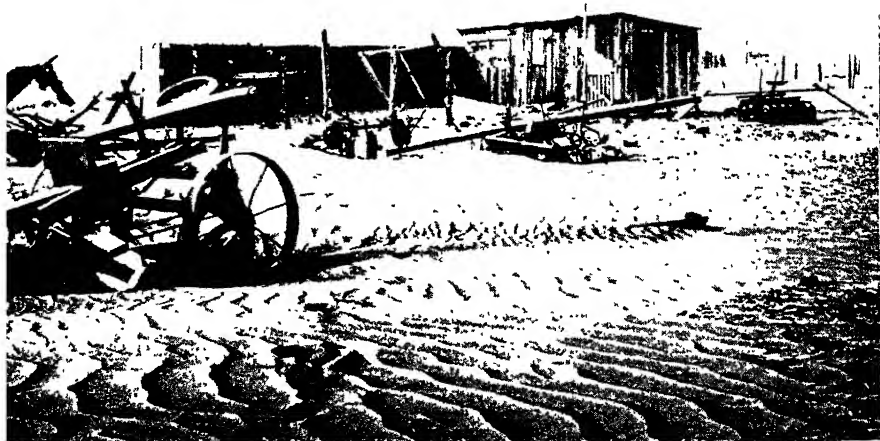
Towards the south the spring-wheat area merges into the *maize* belt whose northern limit is marked by the invisible line, south of which there are at least $4\frac{1}{2}$ months free from frost. The winters are less severe and the summers hotter, longer, and wetter than farther north. A variety of crops are grown, but of them all maize—or corn, as it is called—is the chief, and on it depends, directly or indirectly, the prosperity of the Middle West—the land of corn, hogs, and cattle.

This region is the greatest maize-producing area in the world. In autumn the fields are ploughed, and at the beginning of May the maize is sown. In the middle of August such portions of the crop as are needed for fodder are cut, and those not immediately required are chopped up and stored in silos for use in winter. The remainder stands until the autumn. By this time the blazing sun has turned the long green leaves yellow, and hardened the kernels in the closely packed cobs, which have changed to a rich golden hue that tells that they are ready for harvesting, and only waiting to be husked and dried. Some of the maize is used for making cornflour, starch, beer, and vegetable oils for the soap factories. Some is fed to the poultry raised on every farm, but the bulk is used to feed cattle and hogs, numbers of the latter being cured for bacon and ham. Most of the cattle and hogs are, however, sent to the great meat-packing establishments at Chicago, Omaha, Kansas City, St. Louis, and Cincinnati.



9. FARMING IN THE CENTRAL LOWLANDS (TOBACCO AND COTTON)

(Above) A tobacco farm: soil rather than climate determines the quality of the leaves, which are harvested when green, and then hung up to cure in the long barn (left) (see p. 117). (Below) Negro cotton pickers. At the factory the cotton lint passes through ginning machines, which separate the seeds from the fibres. After the seeds have been removed, the lint is packed into 500-pound bales. The seeds are crushed for oil (see p. 117).



10. IRRIGATION AND EROSION

(Above) These orange plantations in the Central Valley of California present a great contrast to the scanty vegetation of the foot-hills. Streams descending from the snow-capped mountains furnish water for irrigating the orchards, and for power (see p. 134). (Below) All that remains of a farmstead in the 'Dust Bowl', where man's attempt to cultivate land only suited to grazing has resulted in disastrous soil erosion (see p. 126).

In the region south of the maize belt proper, *winter wheat* as well as maize is grown. It has a higher yield than spring wheat. Sown in autumn, it reaches a height of a few inches before winter. In spring growth is rapid and the grain is ready for harvesting towards the end of June.

In the fertile Ohio valley and in Kentucky tobacco is the chief crop (see Plate 9).

The Cotton Belt

South of Cairo, at the confluence of the Mississippi and the Ohio, the type of farming changes. Forests and belts of pine still break the landscape, and though maize is grown it is no longer the predominant crop.

The *warm summers with ample rain*, together with *200 days free from frost*, and suitable conditions of soil, have made the lower Mississippi valley and its margins so well adapted to cotton-growing that this region produces half the world's supply. North of Cairo the warm season is not long enough for the successful cultivation of cotton; west of longitude 100° W. the annual rainfall is less than *23 inches, the minimum for cotton-growing without irrigation*. In the south the lowlands bordering the Gulf of Mexico are unsuitable for cotton, mainly because rain falls in autumn when the crop is being harvested.

The soils of the cotton belt vary from sandy, and sandy or clayey loams, to rich dark clays. There are certain districts which, owing to specially favourable conditions of soil and relief, are the most productive. The chief of these are the flood plain of the Mississippi, the 'black waxy' prairies of Texas, and the prairies stretching from the Mississippi valley into Alabama and thence along the inner margin of the Atlantic Coast Plain as far north as Virginia. Considerable damage is often done to the cotton crop by the boll-weevil, the larva of a beetle which attacks the boll of the plants.

In areas where sandy soils predominate pine forests

replace the irregularly shaped cotton-fields. Winding roads link the scattered towns and run past isolated planters' houses, set amidst a country-side dotted with the wooden huts of negro workers. Near each hut is a plot on which maize is grown for food, both for the negroes and their pigs which furnish them with pork, their staple meat dish. Since

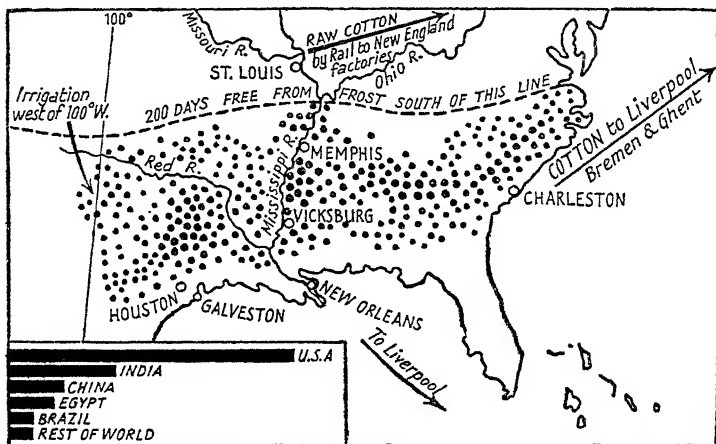


FIG. 35. United States: The Cotton Belt. Inset: Principal producers

many labourers are needed in the cotton industry the rural population is relatively dense.

Cotton is sown in February or early March in the south, and as late as the end of April in the north. Within ten days the plants may be seen peeping out of the ground, and before long they are rigorously thinned out. In due course branches form and buds develop. The flowers resemble those of the hollyhock: white at first, they soon change to pink and later deepen to crimson.

As the petals fall they expose the *boll* or pod, which continues to grow for six or seven weeks until it reaches the size of a hen's egg. Then it bursts open and discloses a mass of fluffy white cotton *lint* entirely covering the seeds. The hairs, or fibres, vary in length, but most of

them are of the medium-staple variety, between $\frac{7}{8}$ and $1\frac{1}{8}$ inches long.

Picking commences at the end of August and lasts into the autumn, for the bolls do not all ripen at the same time. Mainly for this reason little picking is done by machinery. As it is carried out almost entirely by hand there is a demand for cheap labour, which is supplied by negro men and women and in some parts by Mexicans. The pickers work with great rapidity, and, using both hands, extract the fluffy lint from each boll at one go, taking care not to remove any of the leaves or petals as it is difficult to extract these afterwards. As soon as their bags are full they are collected and taken to factories where the lint is ginned by machines which separate the seeds from the fibres. The latter are packed into bales, each weighing 500 lb., while the seeds are crushed by machinery, and the oil obtained from them is used in the manufacture of such products as margarine, and the residue is pressed into oil-cake for fattening cattle.

Though some of the crop is still shipped by river, the greater part is now transported by rail to inland markets and the ports. Among the former is *Memphis*, a town with a population of 250,000 which stands on a bluff overlooking the Mississippi, well above flood-level. Houston and Galveston, both in Texas, are the leading cotton-exporting ports, followed by New Orleans and Savannah, the latter being on the Atlantic coastal plain. Some cotton is sent via the Panama Canal to San Francisco and Seattle whence it is re-exported to Japan. An even greater amount is shipped to Great Britain, Germany, and France, which with Japan are the leading importing countries.

Mineral Resources of the Central Lowlands

The Central Lowlands are rich in coal, but the total yield of the fields is far less than that of the Pennsylvanian and West Virginia sections of the Appalachian coal-field. The principal fields are (a) the *Michigan* field, between Lakes

Michigan and Huron, where the coal is of a rather low grade; to the east of which stands *Detroit*, the famous motor-manufacturing centre; (b) the *Eastern Interior* field, extending through Illinois and Indiana into Kentucky; (c) the *Western Interior* field, lying west of the Mississippi, and stretching from Iowa southward to Texas.

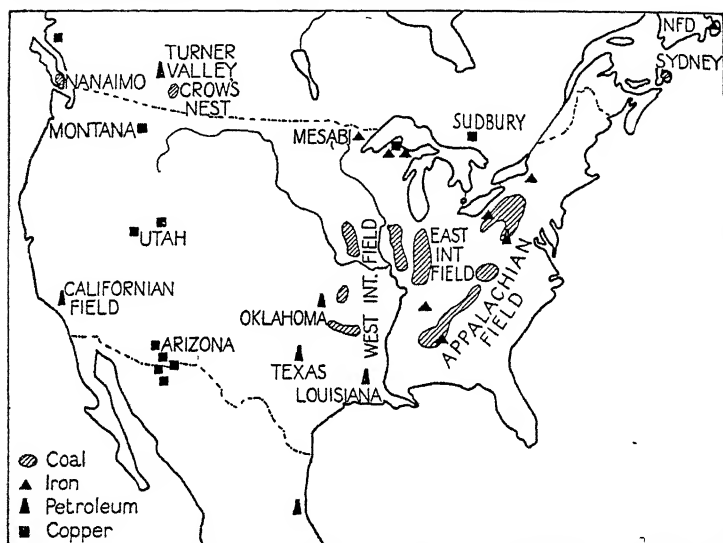


FIG. 36. North America: Distribution of Coal, Iron, Petroleum and Copper

The principal *iron-ore* mining region in the United States lies in Minnesota, west of Lake Superior, where the *Mesabi Range*, 100 miles north of Duluth, and the district round Hibbing produce a quarter of the world's supply. From the open-pit mines (see Plate 7) the ores are sent by rail to Duluth. From this port they are shipped by the Great Lakes (i) to Chicago and Gary, at the southern end of Lake Michigan, where they are smelted with coke from the Illinois-Indiana coal-field; (ii) to Cleveland and Buffalo, on Lake Erie, whose blast furnaces are supplied with fuel from the Pennsylvanian field.

Copper is mined in the Keweenaw Peninsula which projects north into Lake Superior.

About two-thirds of the world's *petroleum* is obtained from the United States, much of which comes from the cotton belt. The chief oil-fields in this region, in order of importance, are those of *Texas*, *Oklahoma*, *Louisiana*, and *Arkansas*. From huge storage tanks near the wells the oil is pumped through pipe-lines, extending for hundreds of miles, to refineries at Galveston and other ports, whence it is pumped aboard tankers. Piping is the cheapest method of transporting liquid fuel, and some idea of its widespread use in the United States may be gauged from the fact that there is 1 mile of pipe-line for every 8 miles of railway.

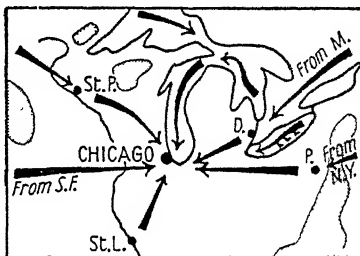


FIG. 37. Site of Chicago

Towns of the Central Lowlands

Chicago ($3\frac{1}{2}$ millions), the second largest city in the United States, and, of course, the chief city in the Central Lowlands, is situated at a point where land routes from east to west pass round the southern end of Lake Michigan. Standing in a central position, where land and water routes meet, it has become a great port and the largest railway junction in the world. Its position as the outlet for the maize and wheat belts has played the major part in making it the leading grain market in the United States, a flour-milling centre, a cereal-exporting port, and the greatest meat-canning city in the world. In relatively close proximity to coal, and conveniently situated for obtaining iron-ore by water (from the Mesabi Range, &c.), it is noted for iron and steel manufactures; while its nearness to a forested area has resulted in the establishment of saw, pulp, and paper mills.

Cincinnati, on the Ohio, another meat-packing city, makes agricultural machinery, uses local clay for pottery, and maize-oil in its soap factories. *Louisville*, farther down the Ohio, manufactures tobacco grown in the lower portion of the valley.

St. Louis stands near the confluence of the Mississippi, the Missouri, and the Illinois. For a long time it was the last town where the Mississippi was bridged, and this fact, coupled with its position at a meeting-place of convergent waterways, early made it important, and later caused it to become a focus of railway routes. Placed in the middle of the maize belt, within easy reach of the wheat lands to the north, the cotton-growing area to the south, the ranching lands to the west, and the tobacco lands of the Ohio valley, it is a great cattle and cotton market, a flour-milling, tobacco, and boot- and shoe-manufacturing centre; and in spite of the clearing of forests still a fur market. It is conveniently situated for forwarding pastoral products to eastern cities and ports; for collecting machinery and other manufactured goods from the Pennsylvanian industrial area, and for re-distributing them throughout the Middle West.

The Gulf-Atlantic Coastal Plains

These lowlands form a continuation of the Interior Plains, which in some respects they resemble, though their proximity to the sea causes them to differ in others. Through their ports is exported much of the cotton crop, but as the hotter damper climate of the coastal areas is unsuited to growing cotton the people are engaged in other activities.

The low sandy coast running from Virginia, around the Peninsula of Florida, and along the northern shores of the Gulf of Mexico, has no really good natural harbours, and ports such as New Orleans, Houston, and Savannah are situated at varying distances up the rivers. Some of the coastal towns, like Miami and Palm Beach in Florida, are popular winter resorts.

In many districts cypress swamps fringe the plain and extend up the lower reaches of the rivers. The forests of Florida yield yellow pine and palms. Fruits like oranges, lemons, grapefruits, and bananas also remind us of the hot wet climate. So does the rice grown on swampy lands margining the Gulf of Mexico, and the sugar-cane produced on better-drained ground behind the coastal area. Along the Atlantic and Gulf seaboard, from Virginia to Texas, are thousands of truck farms growing vegetables and soft fruits which, like the sub-tropical fruits, find a ready market in the North-Eastern States. Tobacco is cultivated in Virginia and the Carolinas, whose sandy loams, like those of the trans-Appalachian states of Kentucky and Ohio, are especially well suited to this crop (see Plate 9). *Raleigh*, like the port of *Richmond* on the James River, is noted for its tobacco factories.

New Orleans, one hundred miles up the Mississippi, stands at the head of the huge delta. It is built on land actually below the level of the river, from which it is protected by levees. Besides cotton, it exports grain, and it imports bananas from the Caribbean lands, coffee from Brazil, sisal from Yucatan, and petroleum from Mexico and Venezuela.

The High Western Plains

Towards the west the Mississippi lowlands rise gradually to the High Plains which, near the Rockies, attain an elevation of 5,000 to 6,000 feet, and whose average width is 500 miles. They extend from eastern Montana, through Wyoming and the east of Colorado, southward into Texas. The High Plains are crossed by the Missouri, Yellowstone, Platte, and other tributaries of the Mississippi, which have cut deep canyons, whose floors are filled during the late spring floods, but which otherwise contain only relatively small streams. In the Yellowstone National Park (5,500 square miles) the natural scenic beauty and wild life are preserved. The lava-flows, extinct volcanoes, hot springs

and geysers tell of past volcanic activity; the canyons show the effect of erosion by rivers in a dry area. Bison, moose, and bears wander through forests traversed by splendid highways, beavers build their dams across the streams, and in summer many Americans spend their vacations camping in this natural playground.

Ranching, Dry Farming, and Soil Erosion

Outside the valleys the High Plains consist of rolling prairies, but there are barren areas, which in many cases are due to the white man's lack of foresight when opening up this region. Owing to the scanty rainfall the vegetation consists mainly of tufts of grass, cactus, and sage-bush, with short-grassed country in some districts, such as the high plateau of Wyoming.

Here the plains rise to the foot-hills of the Rockies, there they form a broad sweep between two ridges, and then in the distance a line of trees and a gleam of running water tell of a fertile valley with villages and farms. A clump of cedars with massed green foliage and greyish trunks, and a cluster of pines, add variety to the landscape, but in the main the surface of these pastures is unbroken except by an occasional wind-pump, or the weathered wooden cabin of a cowboy. The wooden houses of the ranchers are usually commodious, and in some verdant valley the traveller may happen on a pleasant homestead surrounded by its barns and cattle corrals. Store cattle are grazed in the east, but in still drier and more rugged areas nearer the Rockies they are replaced by sheep.

At the beginning of the present century enormous herds of cattle wandered freely over the plains, from Texas in the south to Wyoming in the north, but now most of the ranches are fenced and subdivided with hundreds of miles of barbed wire. Several acres are required to support one animal, and it is these fences, and the pens and loading platforms at the isolated railway stations, which provide the clues that

tell of the enormous number of cattle dispersed throughout the region.^f Market towns include Cheyenne and Denver, though the latter is better known as a smelting centre for the mining areas to the west (see p. 131). Of the towns at the junction of the ranching lands and the Maize Belt to the east, *Omaha* and *Kansas City*, both on the Missouri, are the chief. In autumn many animals are sent eastward by rail to their meat-packing establishments, while others are taken to be fattened on the prosperous farmlands of the Middle West.

But in some areas the cattleman has given way to the farmer, who grows cereals and forage crops, like alfalfa, by *dry-farming* methods, which aim at conserving moisture in the soil. The ground is ploughed in early summer and left fallow until the following spring. It is, however, harrowed from time to time. This process serves a dual purpose. It prevents the hard crust forming after rain, which causes the water to be drawn to the surface by capillary action; and prevents grasses from springing up and so using the scanty moisture. Crops are usually sown every other year and thus, in effect, have the benefit of two years' rainfall. In dry farming the ground must be as carefully cultivated when fallow as when planted.

Superficially the advantage of dry farming lies in the fact that it permits the utilization for cultivation of semi-arid lands that can be bought quite cheaply. Actually the greater part of the High Plains is quite unsuited to cultivation, and Man's attempt to turn pasture into arable land has too often had disastrous results. The ploughing up of land removes the protective grass covering. In regions with a fair rainfall the crops, which replace the natural vegetation, ensure sufficient cohesion in the soil to prevent undue erosion. But in semi-arid areas, during the not infrequent droughts the wind literally strips the soil from the fallow fields and carries it away in dust storms. That part of the High Plains stretching from eastern Colorado into Nebraska is aptly termed the *Dust Bowl*, because it is ravaged by dust storms.

It is a desolate country, much of which, as a result of wind erosion, is to-day little better than desert. It seems almost impossible to believe when motoring through it that little more than half a century ago great herds of bison grazed here on tall waving grasses. For now there is no grass, and there are no trees, only deserted farm-houses, half buried in dust, which testify to the calamitous effects of the way in which Man has upset the balance of Nature. In short, he has failed to adapt himself to his environment (see Plate 10).

Some areas in the Dust Bowl are quite beyond reclamation. Others have been successfully returned to pasture and made suitable for settlement. Soil erosion is by no means confined to the Dust Bowl, and in many parts of the United States the Soil Conservation Service has adopted various methods for rescuing waste land. Terracing—the traditional method of the Old World—is now widely practised. In other cases the natural regeneration of pasture has been facilitated by spreading layers of brushwood over the soil. The planting of different crops in alternate strips has also proved an effective method of restoring derelict districts.

The desire of the farmer to oust the cattleman, which in so many cases has been the primary cause of soil erosion, is a modern version of the age-old struggle, still carried on in many parts of Asia, between the people of the 'steppe' and those of the 'sown'.

EXERCISES

1. (a) Name the *two* chief cereal crops grown in the Central Lowlands. (b) Show how the conditions of climate and relief are well suited for the large-scale production of *one* of them.

2. Write an account of cotton production in the Central Lowlands under the headings: Climate; Relief and Soils; Seasons of Sowing and Harvesting; Labour; Methods Employed to Transport the Crop; Three Important Ports of Export.

3. (a) What do you understand by *dry farming*? What are its advantages? What is the effect of this method when practised in an unsuitable environment? (b) Describe briefly some of the steps taken by the Soil Conservation Service of the United States to combat soil erosion.

4. (*a*) Show how the industries of St. Louis are related to the surrounding region. (*b*) State the nature of the outward and inward traffic between the agricultural belt of which St. Louis is the centre and (i) the eastern ranching region, and (ii) the Pennsylvanian Industrial area.

5. Show how the activities of the people in the southern part of the Atlantic Coast Plain are related to their environment.

CHAPTER XVII

THE INTERMONT PLATEAUX OF THE WESTERN CORDILLERAS

A Rainless Land

BETWEEN the main chain of the Rockies and the Cascade-Sierra Nevada line of ranges to the west, lie a number of high plateaux and basins. Shut off by a double mountain barrier from the Pacific, this region is remarkably dry, and the rivers depend for their water on melting snow and ice from the Rockies. In the north the Snake River winds through steep canyons, across the *Columbia Plateau*, to the Columbia River. The plateau is floored with volcanic strata formed of lava, which in former ages welled up through enormous cracks in the earth, spread over the land, and subsequently cooled. Farther south the *Great Basin* of inland drainage lies around the Great Salt Lake. Towards the east the Colorado rolls its yellow, silt-laden waters, across the plateaux of Utah and Arizona, to the Gulf of California, speeding through canyons cut deep into the horizontal strata. The most famous of these steep gorges is the Grand Canyon, one of the natural wonders of the world (see Plate 2).

This vast trench is 200 miles long, from 4 to 12 miles wide, and over a mile deep. In other words it is as long as from London to York, and so deep that if Ben Nevis—the highest peak in Britain—were placed therein its summit would be 1,000 feet below the level of the plateau above. The Colorado has been aided in its work of cutting down the gorge by the rapidity of its current, and by the vast amount of hard grains of sand it carries along with it, while the depth of the gorge is also due to the fact that the sides have risen gradually in comparatively recent geological times. But owing to the dryness of the atmosphere rain and

running water have not worn away the almost vertical sides of the canyon as they would have done in a wetter region. Hence the down-cutting force is immeasurably greater than the lateral erosion. One of the most characteristic features of the gorge is the way that the lines of strata—limestone, sandstone, and granite—on the one side correspond with those on the other. Many deep canyons run into the main valley, and the whole plateau is cut up into giant tabular blocks, on a scale so vast as to be almost overpowering.

In this clear atmosphere the wonderful colouring of the rocks and sky defy description, but perhaps the most beautiful effects are seen at night, when we look up from the bottom of the canyon to the dark-blue vault of the heavens crowded with large bright stars. At noon the walls of the canyon look intensely arid, but at sunset deep shadows are thrown from side to side of the gorge, until as they mount upwards the whole chasm is veiled in inky blackness.

Dry Farming and Irrigation

Owing to the scanty rainfall much of this region consists of deserts and arid lands clad only with cactus and sage bush. There is some rough grazing, and where dry farming is practised, or the land irrigated, it produces fine crops. Dry farming enables excellent wheat to be grown on the rich volcanic soils of the Columbia Plateau.¹ *Spokane*, the chief town, at a focus of routes, mills flour, using electric power obtained by harnessing the waters of the Spokane River, a tributary of the Columbia. The irrigated lands round *Salt Lake City* are noted for peaches, apricots, citrus fruits, and vegetables, many of which are dispatched in refrigerating cars to the Eastern States. Other oases are found in the valley of the lower Colorado, and to the west of the river in the Imperial Valley, round Salton Lake, where cotton, fruit, vegetables, and fine dates are cultivated. When the schemes in connexion with the recently constructed

¹ See note at end of this chapter.

Boulder Dam, on the Colorado River, are completed they will make possible the irrigation of an area in Arizona half the size of Wales; and the fall of water at the dam will enable four times as much power to be generated as is produced by all the American hydro-electric plants at Niagara.

In Arizona and New Mexico a reservation of approximately 12,000 square miles has been set aside for Indians. The people, who wear their traditional dress, live in flat-roofed adobe houses, each family having its little enclosure for cattle and horses. The villages are plentifully supplied with outdoor ovens—rather like huge half-eggs—high wooden erections on which grain is dried, and threshing-floors. Very picturesque these settlements look, especially when perched on the top of isolated flat-topped rocks, which are a characteristic feature of the region (Plate 1).

Mining

Owing to the scanty rainfall the agricultural activities of this area are of necessity limited, and its chief wealth lies in its minerals. The United States is the principal country for the production of copper, lead, and zinc; ranks second to Mexico in the output of silver; and together with Canada accounts for about one-quarter of the world's gold. The bulk of these minerals are won from mines scattered throughout the western mountain states. *Arizona*, *Utah*, and *Montana* lead in *copper* production, followed by *Michigan* (Keweenaw Peninsula). In most cases the copper is smelted near the mines. It is then sent to large refineries at ports on the north-east coast of the United States which are conveniently placed for American and European markets, and for handling ores sent from Chile and Peru via Panama. *Utah* and *Montana* yield most *silver*; and *Colorado* ranks next to *California* in her output of *gold*. On the other hand, *bauxite* (the ore of aluminium), is mined in *Arkansas*, whence it is sent to aluminium-works, at such places as Niagara Falls, where the cheap electric power necessary for its

manufacture is available. The principal smelting centre, to which ores are sent from all parts of the Western States, is *Denver*, on the eastern side of the Rockies, which has grown from a small gold-mining town to one with 300,000 inhabitants.

EXERCISES

1. (a) How do you account for the formation of the Colorado and similar canyons, found between the ranges of the Western Cordilleras?
(b) Draw a contour map of such a canyon.
2. Show how the occupations of the people living in the area described in this chapter are influenced by their environment.

Note. In 1940 the vast Grand Coulee Dam—greater than the Boulder Dam—was completed on the Columbia River in the north-east of the state of Washington. Its waters will provide power, and will be used to irrigate an enormous area, where the annual rainfall is less than 10 inches.

CHAPTER XVIII

THE PACIFIC LANDS OF THE UNITED STATES

Climatic Differences

HIGH ranges separate the Pacific Lands from the eastern part of the United States. In pioneer days the Western Cordilleras, and the remoteness of the western seaboard from the Atlantic, hindered the development of this region. But the building of trans-continental railways through the mountain barrier, and the construction of the Panama Canal, have greatly lessened the isolation of the Pacific Lands.

Between the Coast Range on the west, and the steep wall of the Cascade Mountains and Sierra Nevada on the east, are two longitudinal valleys separated by a belt of high ground. The more northerly, the Great Pacific Valley, lies in the states of Oregon and Washington. The more southerly is the Central Valley of California. Climate is the principal factor in the differences that mark the two regions. Oregon and Washington belong to the same natural region as the adjacent area in British Columbia. Lying in the south-westerly wind belt they receive rain at all seasons and have cool summers and mild winters almost free from snow in the lowlands. On the other hand, the Central Valley of California has a typical Mediterranean climate, with hot, rainless, and brilliantly sunny summers and mild showery winters.

The climate and configuration are reflected in the mode of life of the people. The rugged mountains have few inhabitants, and in both the Great Pacific Valley and California settlement is mainly confined to the lowlands. In the former valley the rainfall is ample, but in California, which is practically rainless in summer, many towns lie along the banks of the rivers, or at the foot of the mountains where streams furnish water for irrigation and power.

The Great Pacific Valley and its Margins

The submerged northern portion of the Great Pacific Valley forms Puget Sound. The southern part is drained by the Willamette, a left-bank tributary of the Columbia, the great river which after leaving the Columbia Plateau breaks through the Cascades and the Coast Range to enter the Pacific through a wide estuary. The damp equable climate, and the limited area available for cultivation, favour mixed farming, including dairying and the cultivation of cool temperate fruits. The climate is also responsible for the magnificent growth of the forests which clothe the lower slopes of the mountains. Snow-fed streams, like the Columbia, provide transport for logs and furnish power. Many salmon are caught in Puget Sound and the Columbia River. *Seattle* (365,000), on Puget Sound, a terminal port for the Great Northern and North Pacific Railways, has saw mills, shipyards, aeroplane works, fish canneries, and factories where fish-containers are manufactured. It does much trade with Alaska, and like *Tacoma*, a little farther up Puget Sound, carries on a considerable commerce with the Far East, exporting raw cotton and copper, and importing tea, rice, and raw silk. *Portland*, on the estuary of the Columbia River, has a somewhat similar overseas trade. It also saws timber and mills flour with wheat brought from the Columbia Plateau (see p. 129) for which it is the nearest port.

California

The Great Valley of California, 400 miles long and from 40 to 50 miles wide, is drained by the Sacramento from the north and the San Joaquin from the south, which unite shortly before entering San Francisco Bay. The 'Gold Rush' of 1849 drew people to California from all parts of the world, but after the boom was over many turned their attention to agriculture. They grew drought-resisting cereals, like wheat, and bred cattle and sheep. These occupations are still carried on, but cereals are restricted to areas that

cannot be irrigated and grazing is confined to lands unsuited for tillage. In California irrigation is necessary because of the seasonal nature of the rainfall; in the Intermont Plateaux because of its scarcity.

Fruit growing, favoured by the long, dry, and brilliantly sunny summers, is now the primary agricultural industry.

Before the coming of the railways exports were restricted to relatively non-perishable commodities, like grain. But with the advent of the trans-continental lines, and the introduction of the refrigerating car, irrigable lands began to be increasingly devoted to fruit production. Oranges, lemons, and grapefruits are grown round Los Angeles and in the San Joaquin and Sacramento valleys, where there are also many vineyards and orchards of apricots and peaches. Some of the vineyards remind the traveller of those in Italy, and almost Italian, too, are the

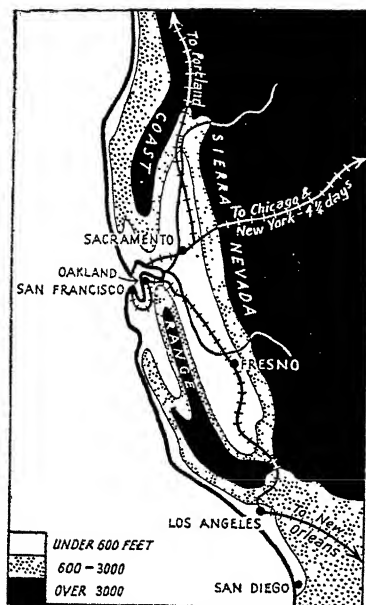


FIG. 38. California

great wine-making houses. But the bulk of the grapes are sun-dried for raisins, while the peaches and apricots are usually canned or dried. Some of the finest fruits are dispatched by refrigerator cars to the Eastern States and Canada.

Around San Francisco Bay thousands of acres are planted with vegetables, and orchards of apples and other cool temperate fruits add beauty to the landscape. Apart from the cultivated areas, the hills surrounding the bay are rather bare. In Indian and Spanish days this must have been

a barren land, for there seem to be few native trees, except two species of oaks and the redwood fir whose leaves are adapted to the copious moisture from the fogs that occur along the coast during summer. These fogs are due to the cold Californian current which cools and condenses the moisture in the warm air. Fortunately the Coast Ranges shut out the fogs and cool air from the Great Valley, and thus, though summer temperatures are low at San Francisco (57° F. in July), those in the interior range from about 90° F. in the south to 82° F. in the north.

The output of the Californian oil wells is only exceeded by that of Texas. Thus California is more than compensated for her lack of coal by her abundant supplies of petroleum and hydro-electric power. From the oil-field in the south of the Valley petroleum is piped to Los Angeles, Monterey, and from that farther north to San Francisco.

In the towns most of the houses stand apart in pleasant gardens, and some are built in the Old Spanish style to which modern ideas of construction have added freshness and charm. Gradually the towns thin out through gardens, orchards, and truck farms, into maize and wheat fields which, in their turn, merge into grazing land and arid stretches along the foot-hills, or rise up slopes clad with magnificent forests, some of whose famous 'Big Trees' exceed 300 feet in height. And though the forests, apart from hotels, holiday camps, and lumber camps, are almost unpeopled, yet the highways running through them are lighted by electric standards. The general high level of physique and good looks tells that in this land of sunshine and plenty the Californian spends most of his leisure time in the open air (see p. 70), while the delightful climate attracts visitors, as well as more permanent residents, from all parts of the States and Canada.

Sacramento, in the northern part of the Great Valley, is the capital of California. But far more important is *San Francisco*. The city stands on the south side of the Golden

Gate, the narrow strait about a mile wide, which pierces the Coast Range and gives access to an enormous lake-like, hill-encircled bay which is one of the finest harbours in the world. Ferries link the city with Oakland and Berkeley, on the eastern side of the Bay, while a bridge, high above the water, spans the Golden Gate. The western terminus of three trans-continental railways, trans-Pacific steamship routes, and American and trans-Pacific air routes, San Francisco is the chief Pacific port of the United States.

Los Angeles (1,280,000), the fifth largest city in the Republic, is an oil-refining centre and a great fruit market, but it is more widely known for its association with the cinematograph industry of which Hollywood is the hub. The wonderfully varied scenery within easy reach of Los Angeles, coupled with the remarkably dry sunny climate, helped to establish the industry in this area. Though to-day films are normally made under powerful electric light, many scenes are still 'shot' out of doors, and owing to the lack of rain the 'properties' can be left standing without fear of damage through bad weather. The bright light and the clear skies enable photographs to be taken during a longer period each day than is possible in England, and the operator can usually be certain that conditions will not change suddenly as they so often do in cooler and damper regions. *San Pedro* is the actual port of Los Angeles. *San Diego*, near the Mexican border, standing on one of the only three good harbours in California, is handicapped by lack of a productive hinterland.

EXERCISES

1. In each of the following cases give *three* reasons explaining why:
(a) California is one of the chief fruit-growing areas in North America;
(b) Los Angeles is the leading centre of the world's cinematograph industry;
(c) most of the trains in California are either electrically driven, or use crude petroleum instead of coal for fuel.
2. Give an account of the Great Pacific Valley under the headings: Relief, Climate, Occupations, and Towns.

CHAPTER XIX

THE UNITED STATES—TRANSPORT AND TRADE

The Development of Communications

IN pioneer days, when roads were few and poor, the carriage of goods by pack-horses and wagons was so difficult and costly that rivers were the chief means of transport. Settlement followed their valleys, and waterways like the Mississippi, Ohio, and Hudson were navigated by craft of all descriptions. Many of the rivers were linked by canals, of which the chief was the Erie Canal whose construction enabled boats to travel from Lake Erie, by way of the Mohawk and Hudson valleys to New York. To-day, with the exception of the Great Lakes, which provide transport for vast quantities of grain, iron-ore, and coal, water-borne trade in the United States is almost negligible.

Railways and Roads

Though the earlier railways were, in most cases, built to supplement the waterways, their subsequent development marked the steady decline of river traffic. At the beginning of 1941 there were 240,000 miles of railways in the United States. This mileage is equal to that of the whole of Europe, is five times as great as that of Canada, and comprises about 40 per cent. of the world's total. The freight carried, which consists mainly of coal, timber, ores, grain, and cotton, exceeds in bulk that of all other countries combined. Traffic is heaviest in the North-Eastern States, owing to the fact that they are the chief industrial and most densely peopled area. Many lines, of course, run from north and south, but of greater importance are the trans-continental railways which carry the products of the Pacific seaboard, and especially of the Middle West, to the cities and ports of the north-east. The main trunk lines are based on the principal seaports

and on certain important inland railway centres. The chief ports are Boston, New York, Philadelphia, and Baltimore on the Atlantic; New Orleans, the gateway to the Gulf of



Mexico; and San Francisco and Seattle on the Pacific. The great inland railway junctions are Chicago; St. Paul and St. Louis, on the Mississippi; Pittsburg; and Kansas City. From these and other centres the trans-continental lines connect with others running to all parts of the Central Lowlands, and with the Canadian and Mexican systems.

In the Appalachians and the Western Cordilleras railway construction was difficult; across the Mississippi lowlands it was easy. As we have seen, the only lowland route leading from the Atlantic seaboard of the United States to the interior is the Hudson-Mohawk corridor. But behind Philadelphia and Baltimore the Appalachians are relatively narrow and less high than farther



FIG. 39. Comparative railway mileage in different countries.

From top to bottom: France, Great Britain, Germany,
India, Russia, Canada, U.S.A.

south. From Philadelphia a railway runs through the Harrisburg Gap to Pittsburg, whence lines go (a) to Chicago, and (b) to St. Louis. The Baltimore and Ohio Railway follows the Potomac Valley, passes through the Cumberland Gap, descends to Cincinnati, on the Ohio, and makes for St. Louis. South of Virginia, owing to their greater height and breadth, no important railways cross the Appalachians, but the lines run parallel to the mountains until they reach the Gulf Plains.

Owing to the southward projection of Lake Michigan,

all the principal lines from the north-eastern ports to the west pass through Chicago, whence railways radiate in all directions.

Five trans-continental lines cross the Western Cordilleras, where the direction of the routes is, of course, determined by the river valleys. The mountain belt is easiest to cross in

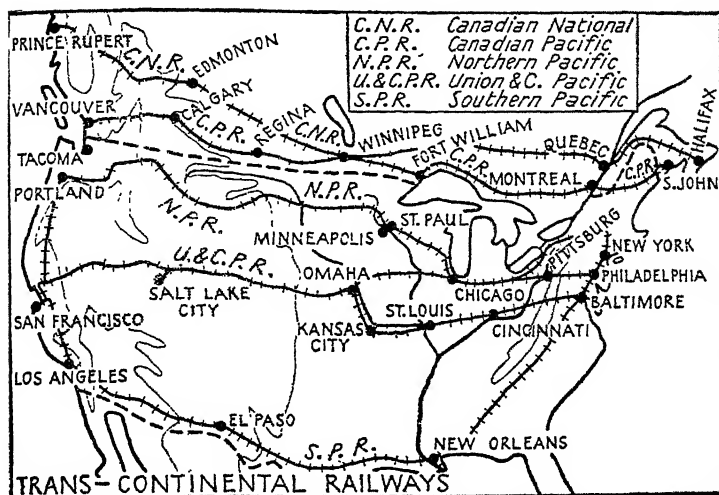


FIG. 40. North America: Transcontinental Railways

the north and south where it is lower and narrower than in the centre. From the Mississippi lowlands three lines run north-west to the Pacific ports of Seattle and Portland; two go from Chicago, via Salt Lake City, to San Francisco; while a third, following a southerly route, links New Orleans with the last-named port, by way of El Paso, on the Rio Grande, and Los Angeles.

As already seen, the influence of configuration on railway construction is strikingly exemplified in the United States. It should, however, be noted that no trans-continental line is under the control of one company as in Canada.

The road system has been greatly extended and improved

in recent years and the main highways are unsurpassed by those of any other country, though many of the secondary roads are poor. Autotrucks and motor-buses compete with the railways for long and short distance transport. Nothing more emphasizes the material prosperity of the people than the fact that the United States owns three-quarters of the world's motor-cars, and that four families out of every five possess one.

Air Transport

The amount of air traffic in the United States exceeds that of the rest of the world combined, and all the principal cities are served by air. Liners from New York, travelling via Chicago, cover the 2,500 miles to Los Angeles in fifteen hours, and the 2,600 miles to San Francisco in eighteen hours. The vast aerial network of the United States is linked with that of Canada, and there are connexions with the West Indies, Central and South America. From New York there are trans-Atlantic services, via Gander, Newfoundland, to Rineanna, Eire; and by way of Bermuda and the Azores to Lisbon. Trans-Pacific services operate between San Francisco and Manila, the capital of the Philippines. The 'clippers' travel via Honolulu, in the Hawaiian Islands, a 'hop' of 2,400 miles, and thence to Midway Island (1,300 miles), Wake Island (another 1,182 miles), Guam (1,500 miles), whence a final stretch of 730 miles brings them to Manila. Allowing for stops *en route* the trip takes seven days, as compared with three weeks by steamer.

Trade

The United States is a great primary producing country, as well as one of the world's leading industrial states. But owing to her enormous population the bulk of her grain, timber, coal, and iron is required for home consumption, and only raw cotton, petroleum, and tobacco figure largely in her exports, so far as raw materials are concerned.

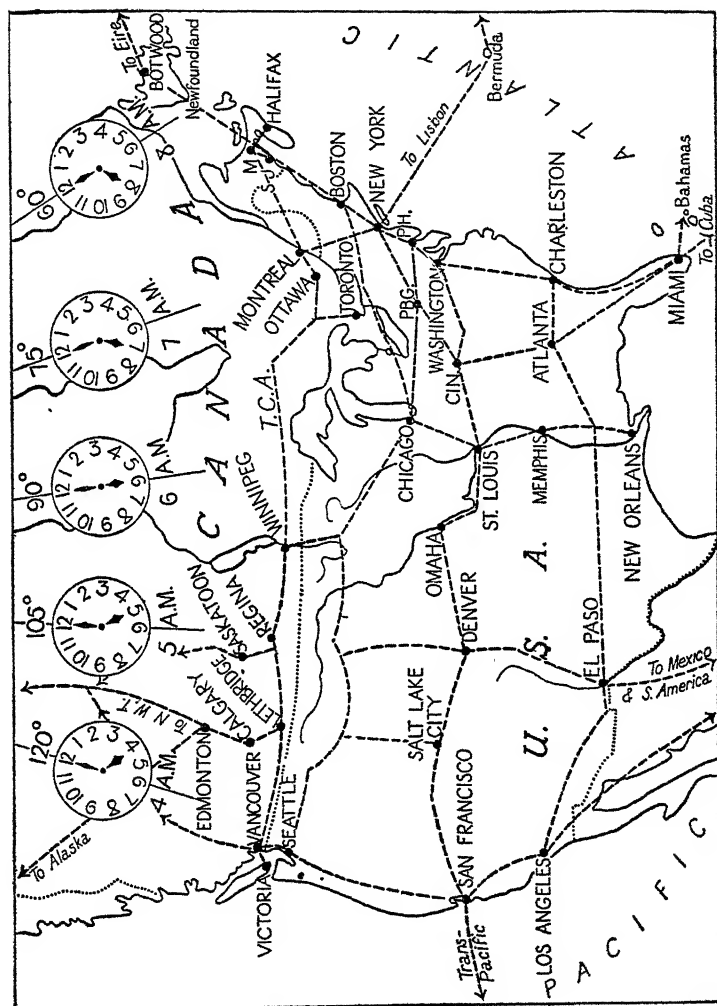


Fig. 41. North America: Air Transport

But as regards manufactured goods, machinery and motor-cars rank high in the export list. The steady demand for tyres, stimulated by the motor industry, necessitates the import of much rubber, obtained mainly from British Malaya and the Dutch East Indies. Recently, however, one

FOREIGN TRADE OF UNITED STATES			
EXPORTS		IMPORTS	
Machinery		Wood, Wood Pulp, Paper	
Raw Cotton		Crude Rubber	
Petroleum		Cane Sugar	
Motor Vehicles		Coffee	

FIG. 42

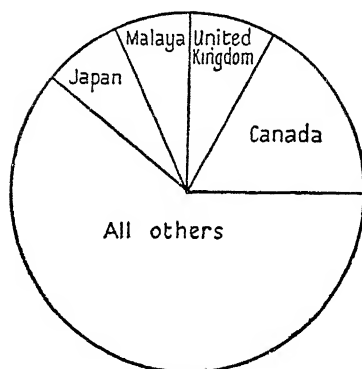


FIG. 43. United States: Imports

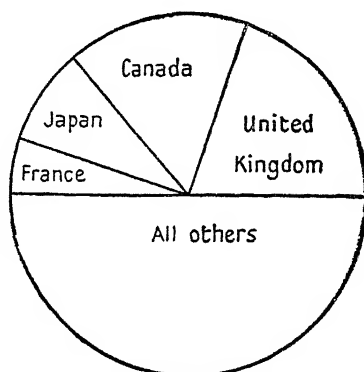


FIG. 44. United States: Exports

American firm of motor manufacturers has established rubber plantations in the Tocantins valley (Amazon basin), and another has started them in Liberia (West Africa). The chief imports are timber, wood-pulp, and paper, for all of which there is such a great call that in spite of the still extensive forests in the States huge quantities are obtained from Canada. A large proportion of the tropical imports come from Latin America. Thus sugar-cane is obtained from Cuba, sisal hemp from Yucatan, bananas from the Caribbean lands, and coffee from Brazil.

Great Britain is the best customer of the United States, taking normally 20 per cent. of her exports, including raw

cotton, petroleum, tobacco, machinery, tinned foodstuffs, and hams. The value of these commodities is about three times that of those purchased by the United States from Britain, of which the chief are cotton, linen, and woollen goods. Japan imports raw cotton, and in return sends to the United States camphor, and in common with other Monsoon countries, silk and tea. There is much reciprocal trade between the United States and Canada, on the one hand, and the republics of Latin America on the other. Geographical as well as political considerations favour trade with both areas, and in the case of the latter many of the products are complementary to those of the United States, one of whose aims is to foster close relations with her sister republics in the Americas.

EXERCISES

1. With the aid of your atlas, describe a journey by rail or air from New York to San Francisco. In either case mention *six* towns en route, describe the nature of the country passed through, or flown over, and the chief occupations of the inhabitants. Give a map.
2. Show how the configuration of the United States has affected the development of the railway system.
3. Name five of the principal *imports* of the United States and say what you can learn from them about the geography of the country. Why are the exports of Canada a better guide to the resources of that country than are those of the United States?

ALASKA

Alaska, purchased by the United States from Russia in 1867, has an area of 586,000 square miles, and a population (mainly white) of 55,000. The North consists of tundra, which provides grazing for domesticated and caribou reindeer; but salmon fishing and lumbering are carried on along the fiorded west coast. Gold and copper are mined. Until recently the Territory was relatively undeveloped, largely because communications with the United States were limited to sea and air. But in 1942 a direct land route was opened up by the building of the *Alcan Highway*, which runs through Canada, east of the Rockies, via Edmonton, to Fairbanks, the chief air centre in Alaska. By road Fairbanks is only 4 days from Seattle (U.S.A.) compared with 9 days by sea to Seaward, and one day by rail (470 miles).

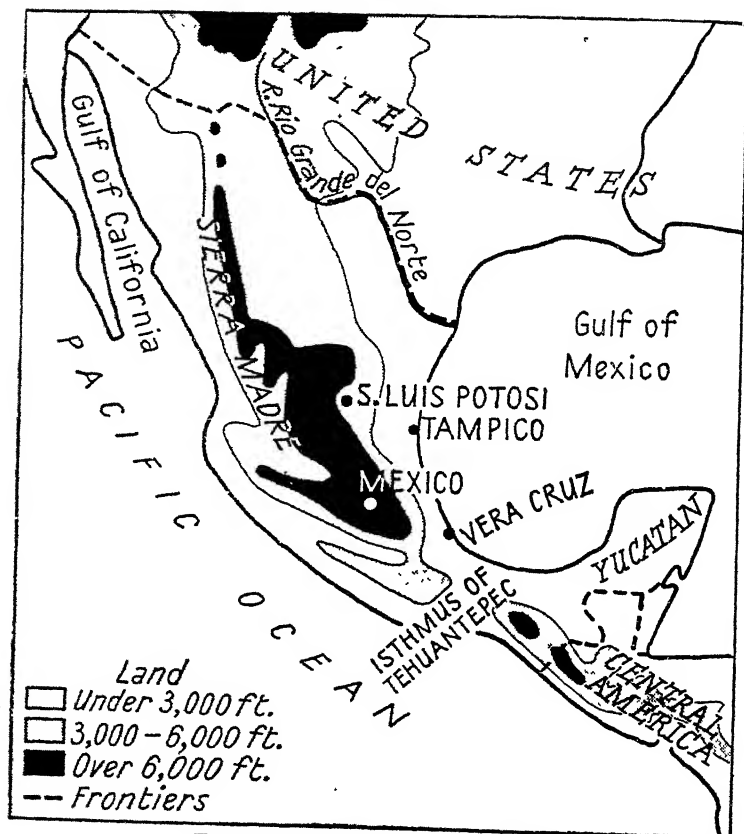


FIG. 45. Mexico and Central America

CHAPTER XX MEXICO AND CENTRAL AMERICA

Mexico

THE Republic of Mexico is about four times the size of Spain, of whose colonial Empire it formed a part for some three centuries. Of its 16½ million inhabitants, about 15 per cent. are white people, mainly of Spanish descent, and the remainder are either Indians or *mestizos* of mixed Spanish and Indian blood.

The heart of Mexico is a high plateau, from 6,000 to 9,000 feet, enclosed by lofty fold ranges that rise steeply from the narrow coastal plains which front the Gulf of Mexico and the Pacific Ocean. In the south the ranges culminate in volcanic peaks, like Popocatepetl and Orizaba, whose snow-capped cones are strikingly beautiful features of the landscape. The marginal mountains prevent moisture-laden winds from reaching the plateau, which is dry and high enough to have a climate which, despite its low latitude, is relatively cool in summer and cold in winter. In the north, which lies in the same latitude as the Californian Desert, the rainfall is exceptionally low: the land consists of desert, or semi-desert, at best suitable merely for poor grazing and only able to support a scanty population. But outside this arid area the tableland is well peopled, and forms the home of about three-quarters of the Mexicans. As most of it lies in the *tierra fria*, or cool zone, the crops are those of temperate rather than of tropical regions, and include maize, wheat, beans, and tobacco, which are often grown in fields separated by cactus hedges. The majority of the people are engaged in farming, though numbers work in the mines. Water from snow-fed streams has long been used to irrigate limited areas near the base of the mountains, but only recently have dams, reservoirs, and canals been built for large-scale irrigation. As a general rule, agricultural

methods are primitive, and the land is worked much as it was in those days when the Mexican Empire was ruled by Spain, whose main interest was in the mineral wealth of the country. So the ground is still scratched with a hoe, or lightly furrowed by wooden ploughs drawn by half a dozen yoke of oxen. The seed is broadcast. Crops are threshed with flails or trodden out by oxen or donkeys, and the grain is winnowed by throwing it into the air, and allowing the wind to blow away the chaff. Much of the land is still held by descendants of Spanish families, but the Government is now splitting up many of the large estates. The large *haciendas*¹ are often badly managed, and though the owner may be wealthy, the *peons* live in adobe huts and exist mainly on *tortillas* (flat maize cakes) and beans. Owing to the dry climate and the antiquated farming methods the yield per acre is small.

Some of the higher parts of the *tierra fria* are forested. Above this zone hardy crops can be grown in the *punas*, or treeless grass-lands. The *punas* pass into the *paramos*, or alpine zone, which gradually merge into the *tierra helida*, or snow zone.

But though the plateau suffers from lack of rain the windward slopes of the mountains facing the trade-winds receive heavy rain. The forests of the *tierra caliente*, as the hot zone up to 3,000 feet is called, produce mahogany, logwood, and bananas, while sugar-cane and cotton are grown on irrigated lands in the north. Along the drier Pacific coast vegetables are cultivated for export to the United States and Canada. From 3,000 to 6,000 feet, coffee, tobacco, and maize are the principal crops of the *tierra templada*. The *Yucatan Peninsula*, which owing to its low elevation receives little rain, produces henequen, whose fibre is exported in large quantities to the United States, where it is used as binder twine.

The chief wealth of Mexico lies in its *minerals*, which account for 60 per cent. of the exports. Some of the metals

¹ *Hacienda*: an estate including the house and farm-buildings.

are won by primitive methods, but the more important mines are worked by the up-to-date machinery of large companies, financed by capital more especially from the United States. Mexico is the chief silver-producing country in the world; ranks second for lead, fourth for zinc, and sixth for gold and petroleum. The oil-fields are near the Gulf coast, where the chief areas lie south and west of the port of Tampico, and near Tuxpan. The main copper-mining districts lie in the north-east, adjacent to the United States frontier. The valuable deposits of iron-ore are little worked, because of the limited quantity and low grade of the coal.

Roads are poor (see Plate XI). Rail transport is expensive because the steep mountains fronting the seaboard make the construction of the lines difficult and their operation costly. Some of the main lines have been electrified. From *Vera Cruz*, on the Gulf of Mexico, the railway zig-zags up the mountains to a height of nearly 8,000 feet (see Plate XI) before dropping down to *Mexico City* (7,400 feet), the capital, centrally placed on the plateau. From Mexico City one line continues west to the Pacific port of *Manzanillo*; another runs north through *St. Luis Potosi* and *Monterrey*, whence it crosses the Rio Grande del Norte and connects with the United States railway system. In the south another railway runs across the isthmus of Tehuantepec.

Mexico faces both the Atlantic and the Pacific; its climate is better than that of most tropical lands; it has great mineral wealth and is a land of agricultural possibilities. Yet, despite these facts, the country is relatively unprogressive. It is true that the topography makes communications difficult, but this accounts only partly for the undeveloped state of the Republic as a whole. Its backwardness is due, in large measure, to lack of organizing ability on the part of the white population, and to the illiteracy of the Indians and many of the *mestizos*. Revolutions are the rule rather than the exception. Given stable government, Mexico

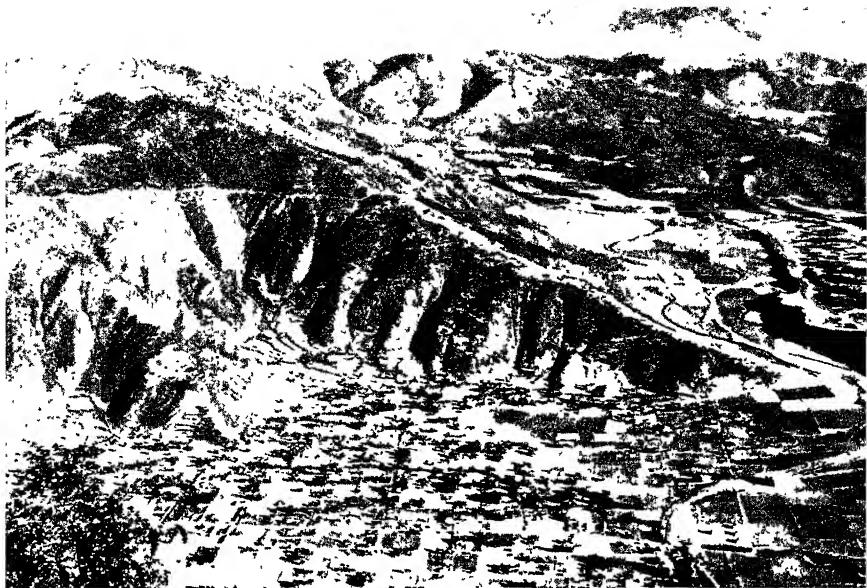
should be able to take her rightful place as one of the leading countries in the Americas.

Central America

Nowhere more than 300 miles broad, Central America extends from the isthmus of Tehuantepec (politically in Mexico) to the still narrower isthmus of Panama. Fold ranges with volcanic peaks rise steeply from the Pacific seaboard, but the Caribbean coast is margined with lowlands, forested, and unhealthy except where drained and cleared. Between these two regions lie a number of plateaux. The connexion of Central America with the two continents it unites was made in comparatively recent geological times, and structurally it is more closely related to Cuba and Jamaica. But, on the other hand, it much resembles Mexico. The configuration of the two regions is not unlike, though the subdivision of Central America into plateaux facilitated the growth of a number of independent republics instead of one state. Its lower elevation and more southerly latitude make the climate of Central America hotter, wetter, and less healthy than that of its more northerly neighbour, with the result that tropical rather than warm temperate crops are grown. Both areas were colonized by Spaniards, and both are peopled chiefly by Indians and *mestizos* with a relatively small white minority.

Unlike Mexico, Central America is not rich in minerals, and agriculture is not only the chief occupation but provides the main exports. The inhabitants draw the same distinction between the climatic and vegetation zones as their neighbours in Mexico and the adjacent area in South America. The majority live on the plateaux or along the Pacific slopes. In these areas—apart from maize and other food produce—coffee is the most important crop and thus one of the leading exports.

In recent years large tracts along the Eastern Lowlands have been cleared for banana plantations, and at the present



11. TRANSPORT IN MEXICO

(Above) This electric railway winds up from Vera Cruz, across the Plateau, to Mexico City. Note the scattered village, with its rectangular layout, and the volcanic peak of Orizaba in the background. Typical of Mexico is the scene (below), where peons and their 'burrows', with panniers slung on either side, are travelling along a country road, lined with the ubiquitous cactus.

12. OCCUPATIONS IN THE WEST INDIES

(Top) Negroes gathering bananas in a plantation in Jamaica. The fruit is cut before it is ripe, sent by lorry or light railway to the coast, where it is shipped in vessels fitted with refrigerating plant (see pp. 149 and 155). (Below) Sponge-fishing is important in the Bahamas, where these negresses, supervised by a white overseer, are sorting and grading the sponges (see p. 154).



time this part of Central America, together with other areas washed by the Caribbean Sea, produces about half the world's bananas. The high temperatures, the heavy rainfall brought by the on-shore north-east trade winds, and the deep alluvial soil provide ideal conditions for the cultivation of bananas. They are easy to grow: skilled labour is not required, but first-rate organization is essential in the management of the plantations and for the shipment of the crops which, owing to their perishable nature, must be handled skilfully and dispatched promptly. Hence most of the plantations are owned and worked by Americans, who as a nation have a genius for commercial organization.

Each of the tree-like plants, whose jade-green leaves are from 6 to 10 feet long and 1 or 2 feet wide, produces one bunch bearing from 100 to 150 bananas. In many plantations from 3,000 to 4,000 coloured labourers work under the supervision of white overseers. They are situated near the coast to facilitate export, and as soon as news is received by wireless of the approach of the fruit-ships the bananas are dispatched by light railway to ports, such as Puerto Cortes (Honduras) and Puerto Limon (Costa Rica), where by means of special machinery 30,000 to 60,000 bunches can be loaded into the hold of a vessel in a single night.

Each of the six republics of Central America—*Guatemala*, *Honduras*, *Salvador*, *Nicaragua*, *Costa Rica*, and *Panama*—has one or more short railways, but apart from light lines linking the banana plantations with the ports the mileage is small. Transport is carried on mainly by mules or ox-cart and by steamers on Lake Nicaragua. Of the capitals of the republics, two, Panama and San José (Costa Rica) lie on the Pacific seaboard; three—Guatemala City, Tegucigalpa (Honduras), and San Salvador—are situated on plateaux, and Managua stands on Lake Nicaragua. *Belize*, the port-capital of *British Honduras*, exports mahogany, logwood, and bananas from the forested interior.

The chief importance of the Republic of Panama,

formerly part of Colombia and encouraged to declare its independence by the United States, lies in the Panama Canal cut to link the Atlantic and Pacific Oceans. Work on the canal was commenced by the United States in 1904 and completed in 1914. The length from Colon to Panama is

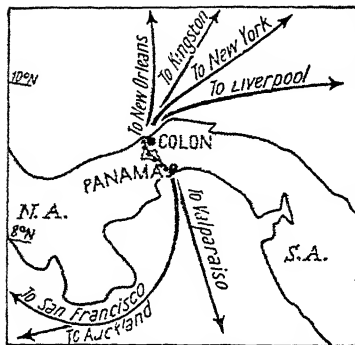


FIG. 46. The Panama Canal

50 miles, and the canal is from 300 to 1,000 feet wide with a minimum depth of 41 feet. Three pairs of locks, near each end, permit vessels to be raised to the level of the Culebra Cut, which was constructed across the watershed between the Atlantic and the Pacific. The passage, which takes about ten hours, enables vessels to save a 6,000-mile journey round South America. Though the canal cost four times as much as the Suez Canal, its tolls are less and both waterways handle about the same amount of traffic. Great Britain ranks second to the United States as regards the amount of shipping passing through the Panama Canal, whose benefit to the latter country, both for trade and strategic purposes, is incalculable.

EXERCISES

1. (a) Name the *three* chief climatic and vegetation zones recognized by the people of Mexico and Central America. (b) Name *three* useful vegetable products obtained from each zone. (c) In the case of *one* important product, produced mainly for export, describe the climatic and other conditions necessary for its successful cultivation on a large scale.
2. Give *four* reasons that help to explain the relative backwardness of Mexico and most of the Central American Republics.
3. Give some account of the trade passing through the Panama Canal from the west coast ports of the Americas to the east coast ports of the United States.

CHAPTER XXI

THE WEST INDIES

Configuration, Climate, and Crops

STRETCHING like a crescent from the peninsula of Florida towards the delta of the Orinoco, the West Indies form the north-eastern margin of the Caribbean Sea. Apart from the Bahamas, built of coral limestone and consequently low, nearly all the islands are mountainous and some are volcanic. With the exception of the Bahamas, the West Indies are wholly within the tropics, but their climate is modified by their insular position. The islands lie in the track of the North-East Trades which bring heavy rain to their windward sides, especially during summer, but the sheltered interior valleys and the leeward slopes are much drier.

Towards the end of the rainy season violent cyclonic storms, called hurricanes, sometimes do enormous damage. They usually move westward over the Caribbean Sea and thence northward, across the Gulf of Mexico and over the peninsula of Florida. The winds, of course, blow towards the low-pressure region in the centre of the depression in an anti-clockwise direction, while at the same time the storm moves forward along its path. Ships may be driven on shore, plantations destroyed, and people killed.

As in other tropical regions, the annual range of temperature is small, varying from about 70° F. in winter to 80° F. in summer. Hence seasonal differences depend on rainfall rather than temperature, distinction being drawn between the dry (winter) season and the wet (summer) season.

Under these climatic conditions the vegetation is luxuriant. Behind sandy shores fringed with coco-nut palms the mountains—especially on their windward sides—are clad with forests where mahogany, logwood, and other trees grow in rich profusion; while on cleared terraces bananas,

cacao, sugar-cane, and tobacco are cultivated at varying elevations. The three chief cash crops are bananas, tobacco, and sugar-cane. Tobacco is cultivated mainly in Cuba.

Though Cuba ranks second to India as a sugar-growing country, it is the principal exporting state in the world. The high temperatures, the heavy rainfall, the sea-breezes, and

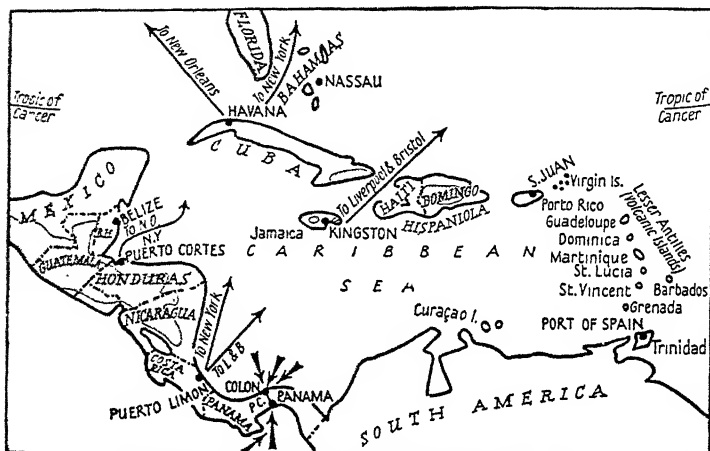


FIG. 47. The West Indies and Central America

the alluvial soils, which in volcanic districts are rich in lime and potash, favour the production of sugar-cane. As sugar-cane does best on recently cleared forest lands most of the estate-owners have reserves of virgin forest which can be cleared as required. The best crops are grown near the sea, but though sugar likes plenty of moisture it also needs good drainage and some months of comparatively low rainfall before harvest, so that it may ripen under the tropical sun. For this reason the harvest begins early in the year, though the actual cutting is often continued until well into June.

The sugar-cane is a tall grass resembling the bamboo in appearance. When the canes are planted they are cut up into sections, which are placed horizontally in furrowed

rows before being covered with soil. It is unnecessary to set fresh canes after each harvest as new ones spring up from the old roots: half a dozen or more crops can be obtained without replanting. The canes are cut by hand, but it is unpleasant work as they form a thick jungle of tropical vegetation. Into this tangled mass go the labourers, each man carrying a curved knife about 2 feet long. First the leaves are slashed off, and when this *trash*, as it is called, has been cleared away, the canes themselves are felled, cut into suitable lengths, and taken to the factory without delay, for after cutting the canes tend to deteriorate. The canes are crushed and further treated to obtain the raw sugar which is subsequently refined. From molasses, a by-product of the sugar-mill, rum—that famous old sailor's tipple—is distilled.

People and Political Divisions

Formerly most of the West Indian islands were Spanish colonies. Now they are ruled by Great Britain, France, Holland, and the United States; and though Cuba, Haiti, and Dominica are nominally independent they are to some extent controlled by the great North American Republic. The whites are mainly of Spanish origin, but in the islands at present ruled by European powers many of the people are descended from colonists of other races who migrated from their home lands. Some of the swarming native population are of Indian stock, but the majority are of negro origin descended from slaves brought from Africa to work on the plantations, while some are *mulattos*, as negroes with some European blood in their veins are called.

Cuba, the most important island, about one and a half times the size of Scotland, has a population of some 3 millions. The bulk of the sugar, which supplies 70 per cent. of the exports, is sent to the United States. The district round *Havana*, the port-capital of the Republic, produces much of the tobacco-leaf used for making the famous

cigars. Other cash crops include coffee, grown on the hill-sides at a height of from 2,000 to 3,000 feet; and sponges which are obtained from coastal waters.

Coffee and sugar are leading crops in the island of Hispaniola, which is divided into the two republics of *Haiti* and *Dominica* (Santo Domingo). *Porto Rico* belongs to the United States. Sugar, tobacco, and coffee are exported from San Juan, the capital. The *Virgin Islands* were purchased from Denmark by the United States in 1916. The volcanic islands of *Martinique* and *Guadeloupe* are French while the Dutch own *Curaçao* and a number of smaller islands off the coast of Venezuela.

The *British Possessions* in the West Indies include Jamaica, Trinidad, and the Bahamas, as well as most of the islands in the Lesser Antilles among which are Barbuda, Dominica, St. Lucia, St. Vincent, Barbados, Grenada, and Tobago. Like most of the islands in the archipelago they concentrate on a few cash crops, such as bananas, sugarcane, or cacao. Produced on a large scale with cheap labour, these products are marketed in Great Britain, the United States, and Canada, which in return send manufactured goods and, in the case of Canada, also fish. Trade between the last-named country and the British West Indies has been fostered by reciprocal tariff concessions, while the relative proximity of the islands to the United States, coupled with the fact that they supply tropical products, has encouraged commercial relations with that country. The opening of the Panama Canal, by affecting steamship routes, has also benefited most of the West Indian islands.

The *Bahamas*, whose area is about two-thirds that of Wales, export tomatoes, sisal hemp, and sponges (see Plate XII). These products are collected at *Nassau*, the capital, and exported mainly to Canada and the United States, with whose wealthier inhabitants the islands are a favourite tourist resort.

Jamaica, the largest of the British West Indian islands,

has an important export trade, especially in bananas and sugar which are sent mainly to the United Kingdom. *Kingston*, the capital, lies on the drier southern side of the island. Its splendid natural harbour, coupled with its position on the route from the Panama Canal to the ports of the eastern United States and Britain, has helped to make it an entrepôt port.

Trinidad, a detached portion of the mainland of South America lying off the delta of the Orinoco, is a quarter the size of Wales. Export crops include cacao, grapefruit, sugar, and coconuts. Even more important is asphalt, which is dug up from the pitch lake of La Brea. The oil-wells in this southern part of the island are one of the chief petroleum-producing areas in the British Empire (see p. 69). Ships run from Port of Spain, the capital, to *Grenada* which produces cacao and nutmegs. Northward lies the densely peopled island of *Barbados* whose staple crops are cotton and sugar-cane.

The Bermudas: a British Outpost in the Atlantic

The Bermudas are a group of some 300 coral islands and islets situated in the North Atlantic, nearly 600 miles east of Cape Hatteras in the United States. But despite their number the total area of the islands is only 19 square miles. Unlike most coral islands they lie outside the tropics and their formation on a submarine reef was probably due to the warm waters of the Gulf Stream. To that stream also they owe their exceptionally mild climate, which coupled with their delightful scenery and sub-tropical vegetation makes them a favourite winter resort with tourists from the United States. The native people, who are mainly black, grow onions, potatoes, vegetables, and lily bulbs which are exported to Canada. Food-supplies, clothing, furniture, and other necessities are imported from Canada and the United States. *Hamilton*, the capital, is situated on the largest island at the head of a deep inlet enclosed by an

encircling coral reef which renders it a sheltered harbour for the small vessels that carry on the local trade. The islands are an important British naval base, and a port of call for trans-Atlantic air liners. In 1940 Britain agreed to allow the government of the United States to establish a naval and air base in these islands.

Future Development

Many of the West Indian islands are the reverse of prosperous, though a brighter future may lie ahead as the result of recent steps taken by the United Kingdom and the United States. The former have established for the British colonies a *West Indian Welfare and Development Fund*, supported by grants from the Home Government, which has enabled improvements to be made in Public Welfare Services, and in agriculture both by increasing the production of staple food crops, and in marketing cash crops for export. There has also been set up a *Joint Anglo-American Caribbean Commission*, whose aim is to foster social and economic co-operation between British and American territories in this region.

EXERCISES

1. Draw a map of the West Indies. Name the islands mentioned in this chapter, underlining those which are British possessions. Insert and name the Tropic of Cancer, the lines of latitude 10° and longitude 80° W. and 70° W. Show by broken arrows, thus ---→, the direction of the prevailing winds. Name along continuous arrows drawn from the chief port, two of the chief products of each of *four* of the larger islands, or island groups.

2. Name *three* ways in which the geographical conditions affect the lives of the people living in the West Indies.

3. Select *one* important export crop grown in the West Indies. Name *one* of the principal areas in which it is cultivated and show why this area is suited for its large-scale production.

4. Account for the following facts: (a) The Bermudas have a very mild climate for their latitude; (b) Many negroes live in the West Indies; (c) The Bahamas are a popular tourist resort with people from the United States; (d) Porto Rico is a more progressive island than Haiti.

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ASIA

CHAPTER I

PEOPLES

Asiatic Races

ASIA, the largest of all the continents, covers more than one-third of the land surface of the globe, and contains more than half the world's inhabitants. The peoples of Asia belong mainly to two great primary races—the Caucasian and the Mongolian. The Caucasians, who also occupy the greater part of Europe and Northern Africa, are found in the south-west of Asia where they inhabit the region stretching from Syria, Palestine, and Arabia to the Plain of Hindustan. The rest of the continent is peopled chiefly by Mongolians, such as the Chinese and the Japanese.

The Caucasians, who have straight and rather narrow noses and relatively thin lips, vary in colour from white to olive or light brown. The Mongolians have yellow skins, those who live in the cooler north being much lighter in colour than those in the warmer south. Their faces are broad and flat, and they have high cheek-bones and almond-shaped eyes, and are not so tall as the Caucasians. The Mongolians are usually referred to as the yellow race, and the Caucasians as the white race. But the distinction between the two is marked rather by the texture of the hair than by the colour of the skin. The hair of the Caucasian is wavy. That of the Mongolian hangs loosely, and is straight, coarse, and black.

In addition to the Caucasians and Mongolians, some of the most primitive types of mankind are found in Asia. They include pygmies, who live in the more inaccessible parts of the Malay Peninsula, the Andaman Islands, and the Philippines; and also the Pre-Dravidians, who comprise some of the jungle tribes of India, the Veddas of Ceylon,

and the Toala of the Celebes, who are akin to the Australian aborigines.

Most of the inhabitants of the East Indies are Indonesians, who seem to be an admixture of primitive Indian and Southern Mongolian stocks, and who vary in culture from extreme primitiveness to a comparatively advanced civilization.

Hence in Asia we shall find people at all stages of progress, ranging from those living in the Stone Age to others of a very civilized type.

Asia—Birthplace of the Great Religions

Religion is a highly important element in the life of the Asiatic peoples, especially in the Arab lands and in India and China. It is both a bond of union and a disruptive factor. Asia was the birthplace of all the great religions of the world. *Hinduism* and *Buddhism* originated in India, though the majority of Buddhists now live in China. *Confucianism* rose up in China where the great teacher Confucius lived about 500 years before Christ; he taught that people should love one another, and especially that they must respect their parents and elders. Thus the Chinese treat their parents and the memories of their ancestors with the greatest reverence. One of the reasons why every Chinese man desires a son is that his spirit may be cared for when he has departed this life.

Mohammedanism, or Islam as it is called by its adherents, arose in Arabia. In numbers it ranks after Christianity and Confucianism as the third great religion of the world, and it is the principal faith in Northern Africa, Arabia, and the arid lands of Central Asia. The Koran, embodying the discourses and sayings of Mohammed, is the sacred book of Islam, and Moslems are forbidden to take strong drink, or lend money at interest, and are enjoined to pray five times a day, with their faces towards Mecca, the birthplace of Mohammed. From Palestine came *Judaism*, the religion of

the Jews, and *Christianity*. All through the East a man is distinguished by religion rather than by race. Islam, for instance, knows no colour bar. In India a man is thought of as a Hindu or a Moslem; in Palestine he is regarded as a Jew, a Moslem, or a Christian.

The Peoples and their Environment

No continent shows more clearly than Asia the effect of environment upon the character, mode of life, and distribution of its peoples. Out of a population of 1,000 millions the majority live in the Monsoon Lands, especially in great river plains such as that of the Ganges. Thanks to their high temperature, summer rains, and rich alluvial soils, these plains have become the homes of dense populations dependent mainly on agriculture, based on irrigation. Large-scale irrigation works, the ruins of which may still be seen, utilizing the waters of the Tigris and the Euphrates, made possible the development of Mesopotamia, the seat of the Chaldean Empire, whose capital was Babylon; and of the Assyrian Empire of which Nineveh was the chief city.

By way of the caravan routes of Central Asia, Mesopotamia was brought into contact with China, whose people were cultured when those in Britain were still untutored savages. The Chinese were skilled farmers and craftsmen; it was they who first learnt to print; who invented the mariner's compass and gunpowder; and who practised the arts of weaving silk and cotton and of making porcelain long before these things were known in Europe.

But if irrigation, dependent on rivers and/or summer rains, has been mainly responsible for the agricultural activities and development of the lowlands of South-East Asia, so the scanty rainfall, coupled with the rugged relief, accounts in large measure for the pastoral occupations and scanty population of Central Asia. Outside irrigated areas, which are the home of agricultural folk, the nomads live much as their ancestors did centuries ago, following regular seasonal

migrations with their flocks and herds. Their homes are tents, easily packed and transported, made from the wool of animals, which is also spun and woven for clothes, hand-made rugs, and carpets of great durability and beauty. The nomads must of necessity live simply, but their life, if somewhat hard according to our standards, is healthy. They are skilled horsemen and, if needs be, fierce fighters, while their migratory habits make them mobile.

Thus, from time to time, when the population has outstripped its means of support, or when successive droughts have reduced the available pasture, adventurous tribes have moved outwards and descended to more fertile lands. Their earliest journeyings are lost in the mists of time. Their more recent wanderings are known. In the thirteenth century many overran China; others like the Magyars made their way westward across the steppes and settled in that part of the Danube Basin which we now know as the Plain of Hungary. In the sixteenth century many poured through the Khyber and other passes of North-West India and, conquering the peaceful agricultural folk living in the Plain of Hindustan, established the Mogul Empire.

But as a rule the nomadic tribes failed to make lasting conquests, and the agriculturists, in the course of time, either absorbed their conquerors or, like the Chinese, drove them back to the pastoral plateaux where their traditional way of living was better suited to their environment.

On its western margin the desert belt of Asia merges into the lands fronting the Mediterranean. In the drier parts of this region the people are mainly herdsmen. In the better-watered districts they are agriculturists, but the hot dry summers and the rough relief put large areas beyond the possibility of cultivation. The inhabitants of the coastlands naturally become seamen. Such were the Phoenicians, the greatest merchant traders of early times, who, from their home along the palm-fringed Syrian shore, sailed throughout the Mediterranean and even ventured into the

Atlantic, whence they sailed northward as far as Britain, and southward along the coast of Africa.

East and West

Thus from the dawn of history the story of Asia has been closely linked with that of Europe. Not only have Asiatic peoples pressed westward into Europe, but from the times of Alexander the Great and the Roman Empire, and through the Middle Ages until the present day, Europeans have sought by conquest and commerce to establish close ties with their larger neighbour. Long before the overseas route to India was found, Marco Polo made his famous land journey across Central Asia to China. And six years after Columbus tried vainly to find the seaway to the East, Vasco da Gama sailed round the Cape of Good Hope, and entering the Indian Ocean in his weather-beaten ships reached India, which some three and a half centuries later passed under British rule.

In modern times the relations between Asia and Europe present many problems. Asiatic peoples, in particular the Japanese, the Chinese, and the inhabitants of India, have absorbed modern ideas from Europe and the United States; and the effect of these ideas on the ancient civilizations of Asia has resulted in difficulties which still await solution. The British, French, and Dutch, owing in the first place to their trading adventures, have become responsible for the government of vast areas in Asia, and all the leading industrial nations of Europe, as well as the United States, have important trading interests in the continent. These countries wish to maintain the policy of the 'open door'—freedom of trade—in China. But Japan, seeking an outlet for her rapidly expanding population, desires to dominate that huge country which is her nearest neighbour.

EXERCISES

1. What are the names of the two chief races of Asia? Describe the appearance of *one* of them and state in what part of Asia this race is chiefly found.
2. Show how the lives of the people living in *one* region of Asia are adapted to their environment.
3. Select *one* thinly peopled and *one* densely populated area in Asia, and account briefly for the differences.



I. RACIAL TYPES IN ASIA

(Top left) This member of the warrior caste is a fine example of the Indo-Aryan inhabitants of India. (Top right) An inhabitant of the East Indies, this smiling boy is an Indonesian, an admixture of primitive Indian, Southern Mongolian, and other stocks. On the bottom left is a Palestinian Arab, typical of the higher classes. The street vendor (bottom right), pictured in Peiping, is obviously a Mongolian. Note his almond-shaped eyes, high cheek-bones, and straight hair.



2. THE HIMALAYAS SEEN FROM LEH, LADAKH

The spurs of the Ladakh Range rise on the left; the Zaskah Mountains are seen in the right background. Leh (11,500 ft.), which is situated in the Upper Indus Valley, has cold winters (Jan. 17° F.), but warm summers (July 63° F.) when the sun's rays are very powerful. As the monsoon does not cross the main ranges of the Himalayas (see figs. 13 and 14), Leh, like other places lying in similar sheltered valleys in the heart of the ranges, has a low annual rainfall (3 in.). Hence irrigation—from snow-fed streams—is essential for agriculture. Compare the terraced cultivation seen in the foreground with that shown in Plate 6. The houses (like most of those in Tibet) have flat roofs. Why?

CHAPTER II POSITION AND PHYSICAL FEATURES

Immense Size

THE name Eurasia is aptly given to Europe and Asia, for the two continents form one vast land mass separated by no well-marked physical or climatic boundary. Indeed, Europe is a great western peninsula of Asia. Of the total land mass of the globe, Eurasia occupies three-fifths, and Asia nearly one-third. Asia is very compact and in proportion to its size has relatively few openings, and over one-third of the continent, that is an area almost equal to that of Canada and the United States, lies more than 600 miles from the ocean.

Asia stretches from within 13° of the North Pole nearly to the equator, and from west to east through 160° of longitude, or roughly half-way round the globe. Thus, except that it reaches farther south, Asia lies in similar latitudes to North America. From Europe, Asia extends eastward to the Pacific; from the Arctic south to the Indian Ocean into which project the peninsulas of Arabia, India, and Indo-China. Apart from New Guinea and the Aru Islands which belong to Australia, the islands of the East Indies are regarded as part of Asia. The division between the two continents is based on a line of fold mountains which can be traced from the Malay Peninsula through Sumatra and Java to the Philippines. At one time Wallace's line, depending on differences of flora and fauna, was regarded as the boundary between the two continents.

Physical Features

The relief of Asia is somewhat complicated, but we can divide it into six major physical divisions:

- (1) the Central Fold Mountains and Plateau;
- (2) the North-East Highlands;

- (3) the Southern Tablelands;
- (4) the Alluvial Plains of South-East Asia;
- (5) the Northern Lowlands; and
- (6) the Eastern Volcanic Islands.

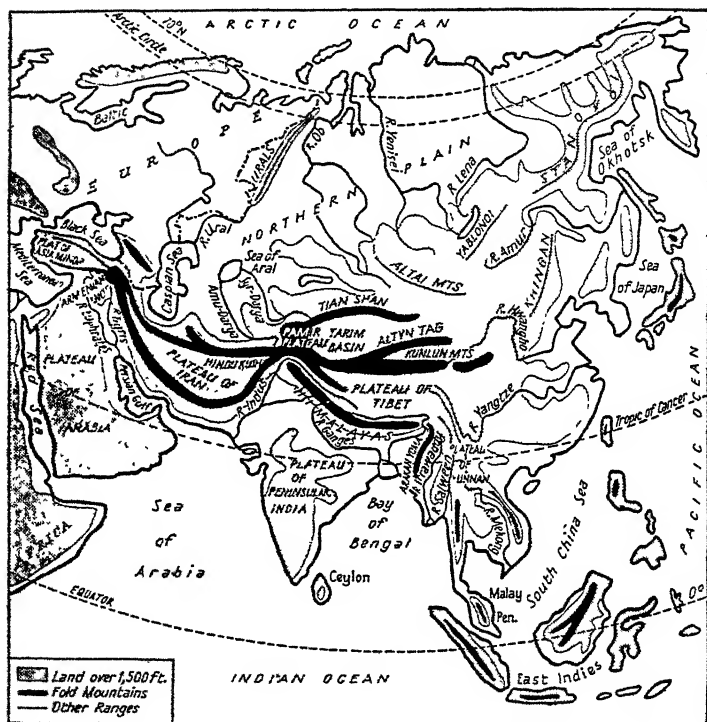


FIG. 1. Asia: Relief and Drainage

1. The Central Fold Mountains and Plateaux

These resemble the fold ranges and intermont plateaux of the Western Cordilleras of North America, though in Asia Nature has fashioned her work on a vaster scale. This Central Mountain System, which stretches from Europe

across Asia to the Pacific, forms a barrier to climatic influences and communications between south-east Asia and the north-west. Notice on Fig. 1 how the ranges form loops enclosing plateaux and basins. The arrangement may best be grasped if we remember that (a) the folds radiate

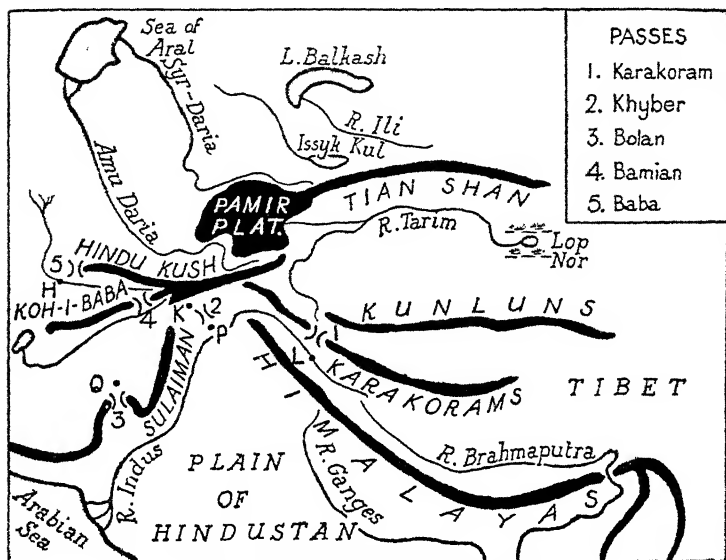


FIG. 2. Asia: The Central Mountains

from two great mountain knots—the *Pamir Plateau* and the *Armenian Knot*, and (b) that they enclose huge and lofty intermont plateaux. Starting from the west, note, on Fig. 1, the position of the ranges and plateaux.

(a) The *Armenian Knot* is separated from the *Caucasus Mountains* by the *Kur* rift valley.

(b) From the *Armenian Knot* the *Pontic Mountains* run west, and the *Anti-Taurus* and *Taurus* south-west to enclose the *Plateau of Asia Minor*.

(c) The *Plateau of Iran* is shut in by fold mountains. From the *Armenian Knot* one line runs from the *Elburz*

Mountains through the *Hindu Kush* to the Pamirs. Another line forms a southerly loop round Iran. Trace it from the Armenian Knot through the *Kurdistan Highlands*, thence along the southern margin of the Plateau, and finally north-east through the *Sulaiman Mountains* to the Pamirs.

(d) From the Pamirs the *Tian Shan* run north-east and the *Kunlun* east to enclose the *Tarim Basin*.

(e) *The Plateau of Tibet*, standing at a height of from 14,000 to 17,000 feet above sea-level, is shut in by the Kunlun Mountains and the *Himalayas*.

(f) From the eastern end of the Himalayas great fold ranges (deflected by the Plateau of Yunnan) run south through Burma as the *Arakan Yoma* and the *Pegu Yoma*. Thence they may be traced (i) through the Andaman and Nicobar Islands, Sumatra, and Java; (ii) by the *Malay Range*, the backbone of the Malay Peninsula; and (iii) through the *Annam Range* running between the Mekong valley and the South China Sea.

The Central Mountain System covers approximately 4 million square miles. Shut off by lofty ranges from rain-bearing winds, it has a scanty rainfall, and it is not surprising that this dry and inaccessible area is sparsely peopled. Most of the rivers do not reach the sea, and the interior of the region forms part of the huge *Inland Drainage* area running eastward from the Caspian.

2. The North-East Highlands

The North-East Highlands are much denuded uplands whose original fold structure has been almost lost. They are composed of some of the oldest rocks in the world, which have weathered to form thin infertile soils, containing minerals such as gold, potash, and coal. But difficulties of communication have prevented extensive mining operations, except in limited areas. The *Altai* and *Sayan Mountains* are separated by Lake Baikal from the Yablonoi Mountains in which the Amur (2,500 miles) rises. Notice

how the Mongolian Plateau is shut in by the Altai and Sayan Mountains on the north, the Tian Shan on the south, and the *Khingan Mountains* and the *Shansi Highlands* on the east.

3. The Southern Tablelands

Arabia, Peninsular India (or the Deccan) and the Plateau of Yunnan are plateaux resembling those of Africa to which at one time they were probably joined. These Southern tablelands are *crust blocks* formed by the fracturing of the earth's crust. We have seen that in some cases the

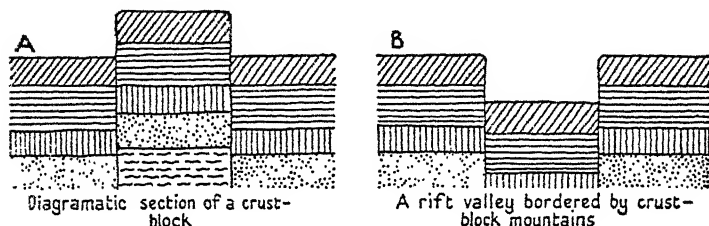


FIG. 3.

strata between two parallel faults slip down, forming a rift valley, such as that now occupied by the Red Sea, to the west of Arabia. In other cases the strata are either (a) left standing above a sunken area on either side, or (b) uplifted bodily above the surrounding land. In either case a crust block is formed.

4. The Alluvial Plains

The Alluvial Plains of South-East Asia include the lowland of *Mesopotamia* built up of sediment brought down by the Tigris (1,100 miles) and the Euphrates (1,700 miles); and the *Indo-Gangetic Plain*, or the Plain of Hindustan, composed of alluvium deposited by the Indus (1,800 miles), the Ganges (1,500 miles), the Brahmaputra (1,800 miles),

and their tributaries. Other important alluvial plains comprise the lower basins of the *Irrawaddy*, the *Salween*, the *Menam*, the *Mekong*, the *Yangtze-kiang* (3,400 miles), and the *Hwang-ho* (2,500 miles).

5. The Northern Lowlands

The Northern Lowlands, an extension of the Great European Plain, are broadest in the west. They may be divided into two portions: (i) *The Siberian Plain* is drained to the Arctic by the Lena (2,500 miles), the Yenisei (3,200 miles), and the Ob (2,800 miles). (ii) *Turan*, which forms the southwest portion of the lowlands, is drained partly to the Caspian, but mainly to the Sea of Aral into which flow the Amu Daria (1,300 miles) and the Syr Daria (1,100 miles). Turan forms part of the Inland Drainage area of Central Asia.

6. The Eastern Volcanic Islands

Stretching from the Malay Archipelago through the Philippines, Taiwan (Formosa), and Japan to the Peninsula of Kamchatka, is a chain of volcanic islands which are the unsubmerged portions of a fold mountain range. Towards the Pacific the islands drop steeply. As in most cases where the coast is bordered by fold mountains the *continental shelf* is narrow; the *continental edge* lies close to the shore-line, and continues the slope of the mountains. But towards the Asiatic mainland the floor of the ocean flattens out sharply, rather like the rim of a soup plate, to form a broad continental shelf, which before submergence took place was part of the land. Hence between the island-fringe and the mainland lie a chain of shallow and almost enclosed seas, extending from the Sea of Okhotsk southward to the South China Sea. Much of the waste of the land, brought down by rivers, is spread over this continental shelf, where, directly or indirectly, it provides food for marine life. So the environment of these marginal seas, which abound in fish, has encouraged those living around their shores to

become sailors and fishermen. Similarly, throughout Asia we shall find many types of environment to which the people have responded in various ways.

EXERCISES

1. How are (i) fold mountains, and (ii) crust blocks formed? Give one example of each from Asia. Illustrate your answer by diagrams.

2. On your atlas find the latitude of the most northerly and the most southerly points on the *mainland* of Asia. What is the distance in miles between these two points?

3. Name the six major physical divisions of Asia. Describe the relief of *one* of them.

4. What do you mean by a region of *inland drainage*? Give *two* examples of this type of drainage and account for *one* of them, paying attention to climate and relief.

5. Draw a diagram to show the comparative length of the chief rivers in North America and Asia. Select *two* rivers in Asia, each flowing into a different ocean, and *one* that does not reach the ocean, and compare their importance. Use your atlas.

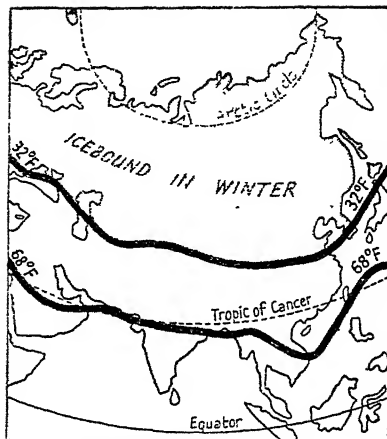


FIG. 4a. Asia: Winter (January) Temperature

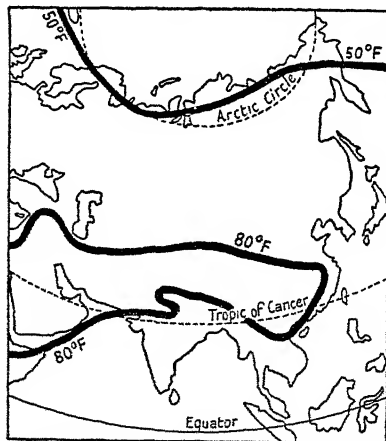


FIG. 4b. Asia: Summer (July) Temperature

Note. Temperatures are reduced to sea-level

CHAPTER III

CLIMATE

IN so vast a continent as Asia, which stretches from the Arctic to the equatorial regions, there are naturally many variations in climate. The compactness of the land mass prevents the moderating influence of the ocean extending so far inland as it would if the coast were deeply indented by openings. The Central Mountain System acts as a barrier to warm rain-bringing winds from the south, and to cold winds from the north. Moreover, the great elevation of enormous areas reduces their temperature.

Temperature

Central Asia has a continental type of climate with hot summers and cold winters. Fig. 4 *a* shows that (*a*) January temperatures decrease from south to north, and that (*b*) considerably more than half the continent has a temperature far below freezing-point during winter. Nearly the whole of Siberia has a January temperature below zero: Verkhoyansk, just within the Arctic Circle, with a mean January temperature of -58.9° F. is the coldest place on earth. It is necessary to remember that the isotherms do not show the actual temperature, but the temperature reduced to sea-level. Thus many regions lying south of the January isotherm 32° F., because of their elevation, have temperatures far below freezing-point, and even below zero.

The northward bend of the January isotherm 32° F., on approaching the Pacific and the Mediterranean coasts, well illustrates the moderating effect of the ocean. Broadly speaking the effect of ocean currents on temperature is not so marked in Asia as in North America, but the Kuro Siwo flowing northward along the east coast of the continent, and

thence along the coasts of Japan, raises the temperature of adjacent lands.

In summer temperatures also show a decrease from south to north. At this season the oceans are relatively cool, and consequently the coastal areas are not so warm as corresponding ones farther inland. For a similar reason the East Indies are cooler than regions farther north, such as the Indus Basin which in summer is one of the hottest parts of the continent. In summer even the north is comparatively warm. The steppes have a summer temperature resembling that of the Canadian prairies. The Arctic coast-lands are by no means cold, but the summers are too short to thaw the sub-soil, which remains permanently frozen.

Pressure, Winds, and Rainfall

By far the most striking feature about the climate of Asia is the seasonal winds, called *monsoons*. We have probably noticed that by the sea there is often during the day a strong breeze blowing from the sea to the land. In the evening, however, an equally strong breeze blows from land to sea. Now the monsoons may be compared to land and sea breezes on a very large scale, except that in the case of the former the period is a year, and in that of the latter it is only a day.

Land and Sea Breezes are due to the unequal heating of land and water, and consequently of the air above their surfaces. These breezes well illustrate the relationship between pressure and winds. During the day the land heats more quickly than the sea, with the result that there is marked low pressure over it, while at the same time there is high pressure over the sea. Hence denser and heavier air from the sea flows in to take the place of the warm air rising over the land, i.e. breezes blow from sea to land. At night these conditions are reversed. The sea, which has been gradually growing warmer during the day, does not lose its heat so quickly as the land. And as it remains warmer for a

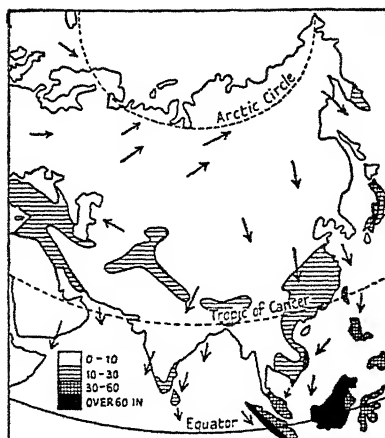


FIG. 5. Asia: Rainfall and Winds
November to April

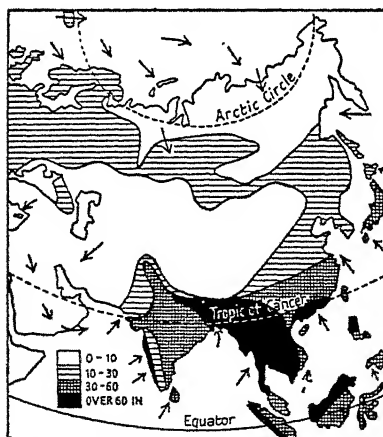


FIG. 6. Asia: Rainfall and Winds
May to October

longer time, the air over it, being relatively warm and light, forms an area of low pressure. Meanwhile there is now over the land an area of high pressure, with air settling down from above. Thus at night heavy cool air blows from the land to take the place of the warm air rising over the sea.

In a similar way monsoons are due to differences in pressure, caused by variations in temperature. In *winter*, owing

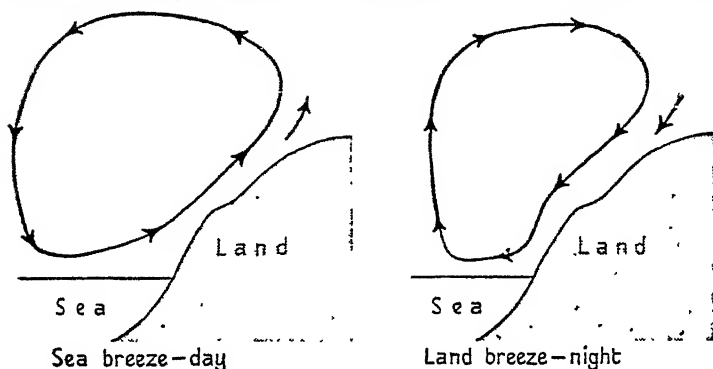


FIG. 7. Land and Sea Breezes

to the intense cold, a region of high pressure, with outflowing winds, is found over Central Asia. The air over the oceans is relatively warm, for it has been absorbing heat during the summer, and consequently cold heavy air flows from the high-pressure belt of the interior towards the regions of low pressure over the oceans. As the winds blow from land to sea they are naturally dry winds, except in areas, such as South-East India and Ceylon, which they reach after crossing the Bay of Bengal.

In *summer* conditions are reversed. Except over very high ground temperatures are much higher over the land than over the surrounding oceans, where high pressures prevail. The hottest part of Asia lies just north of the Tropic of Cancer, where the Indus Basin is the centre of a low-pressure area, which extends outwards. The winds blow from the oceans to take the place of the rising air over

the land. These inflowing winds bring to South-East Asia copious rains, which are especially heavy on the windward slopes of the mountains. In India the moisture-charged winds blow from the south-west. In China south-east winds blow in from the Pacific.

Thus *the monsoon climate is due to seasonal changes of wind*. It is most marked in India, but extends over the whole of

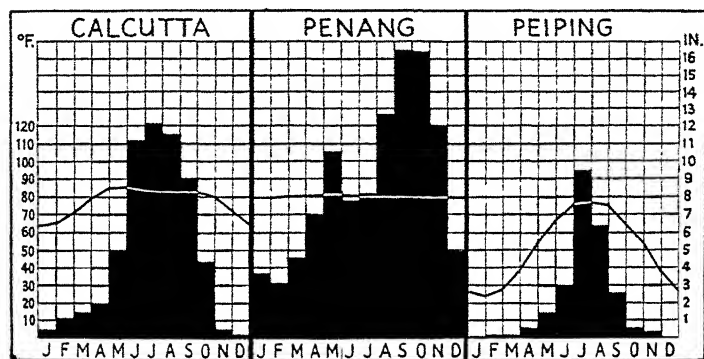


FIG. 8. Rainfall and Temperatures at Calcutta, Penang, and Peiping

South-East Asia, and is also found in other parts of the world, such as Northern Australia. Generally there is little rain in winter, but there are torrential downpours in summer. But while everywhere the summers are hot, winter temperatures vary. Examine Fig. 8 which shows the rainfall and temperature at Calcutta (India), Penang (Malaya), and Peiping (Northern China). Notice that each place has a hot wet summer followed by a dry season. But while January is warm at Calcutta, it is hot at Penang, and cold at Peiping. These three places illustrate the three types of monsoon climate:

- (a) The *tropical monsoon climate* of India, Indo-China, and Southern China;
- (b) The *equatorial monsoon climate* of Malaya and the East Indies;

- (c) The *temperate monsoon climate* of North-East Asia, which includes Central and Northern China, Manchukuo, and Central and Southern Japan.

In the north of the Indian Ocean the currents depend on the direction of the monsoon winds. In summer the south-west monsoon drives the waters of the *Monsoon Drift* in a clockwise direction round the Arabian Sea and the Bay of Bengal, whence some of it passes by the Strait of Malacca into the Pacific, reinforcing the Kuro Siwo. In winter, under the influence of the north-east monsoon, the currents are reversed. They flow in a counter-clockwise direction around the Bay of Bengal and the Arabian Sea, where the *Monsoon Drift* on reaching the east coast of Africa turns towards the south.

North-west of the Monsoon Region a *desert and arid belt* stretches from Arabia, through Iran and Turkistan, into Mongolia. The annual rainfall is under 10 inches and irrigation is essential for cultivation. This lack of rain is due to several causes. (a) Most of Arabia receives little rain because it lies in the belt of the north-east trades, and as these winds are blowing from cooler to hotter latitudes they tend to absorb moisture rather than deposit it and are consequently dry. Their dryness is also increased by the fact that they are blowing over a great land mass and not over the ocean. (b) The *Plateau of Iran* is dry mainly because it is ringed by mountains, which prevent the influence of the ocean from reaching the interior. (c) *Mongolia* suffers from lack of rain partly because it is surrounded by mountains, but chiefly because it lies so far from the sea.

On the north-west the desert and arid belt merges into the *Mediterranean Lands* (Asia Minor, Syria, and Palestine), which lie on the *western side of the continent* between latitudes 30° and 40°. Like the Central Valley of California they have hot dry summers and mild showery winters.

In summer the *Cool Temperate Lowlands* (Siberia) are a region of low pressure. As a result cyclones often

travel far inland: in winter these depressions are fended off by the high-pressure system over this area.

The Arctic Coast-lands have a scanty rainfall because owing to their low temperatures there is little evaporation and the atmosphere is dry.

EXERCISES

1. Study the climatic maps of Asia. Then answer the following questions:

(a) Which region has the greatest range of temperature?

(b) Which region has the least range of temperature?

(c) Which region is (i) coldest in January, (ii) hottest in July? Account for the differences.

(d) Which region has (i) most of its rain in summer, (ii) most of its rain in winter, (iii) little or no rain? Why is irrigation necessary for cultivation in each of these regions?

2. In Asia the winter isotherms bend north as they approach the Pacific coast, but the summer isotherms bend south as they approach this coast. What do these facts tell us about the temperature, and how do you account for them?

3. (a) What is the meaning of the word 'monsoon'?

(b) In what part of the world is the monsoon climate most marked?

(c) (i) Draw a sketch-map of India. (ii) On your map print *low pressure* over the chief area of low pressure during summer. (iii) Show by arrows the direction of the winds at this season. (iv) Shade the areas receiving the greatest rainfall.

4. (a) Find in your atlas the towns mentioned below and write down the latitude of each.

Then study the table and answer the questions (b) to (f).

Town		J	F	M	A	M	J	J	A	S	O	N	D
Calcutta	Temp. ° F. Rain. in.	65 0.4	70 1.1	79 1.4	85 2.0	86 5.0	85 11.2	83 12.1	82 11.5	83 9.0	80 4.3	72 0.5	65 0.2
Penang	Temp. ° F. Rain. in.	80 3.9	80 3.0	81 4.7	82 7.0	82 11.0	81 7.2	80 8.9	80 12.8	80 19.0	80 16.1	79 10.9	79 4.8
Peiping	Temp. ° F. Rain. in.	24 0.1	29 0.2	41 0.2	57 0.6	68 1.4	76 3.0	79 9.4	77 6.3	68 2.6	55 0.6	39 0.3	27 0.1

(b) Which town has (i) the greatest, and (ii) the least range of temperature?

(c) Which is (i) coldest, and (ii) warmest in January?

(d) Which is hottest in July?

(e) Name the three wettest consecutive months at each place.

(f) Classify the climate of each town as either *temperate monsoon*, *tropical monsoon*, or *equatorial monsoon*.

5. Trace (or use) an outline map of Asia. On it draw a line approximately parallel to the coast and 600 miles from it. With the aid of Figs. 5 and 6 estimate roughly how much of the area lying over 600 miles from the sea has an annual rainfall of less than 10 inches.

CHAPTER IV
NATURAL VEGETATION AND WILD
ANIMALS—REGIONS

Natural Vegetation and Animals

IN any particular region the physical features, the types of rocks and soils, the climate, and especially the rainfall, all influence the natural vegetation and animals, as well as the occupations and distribution of the people. No continent shows more striking differences in relief, climate, and vegetation than Asia. In the north, bare, treeless, ice-bound, and almost uninhabited plains fringe the Arctic shore. In the south-east the dense jungles have been but partly cleared by Man. By way of contrast great river plains, like those of the Ganges and the Yangtze-kiang, have from early times been so thickly peopled and intensively cultivated that the original vegetation has almost entirely disappeared.

The Tundra lowlands which spread along the shores of the Arctic Ocean, from Europe across Northern Asia, have long severe winters when the snow-clad ground is frozen hard and rivers and lakes are covered with ice several feet thick. During the short summers daylight is almost continuous and the sun does not set for several weeks. But its rays are too slanting to have much heating power and the ground is permanently frozen below a depth of a few feet. The vegetation consists of mosses and lichens, with here and there dwarf birches and willows, a foot or so in height, and low berry-bearing bushes such as the red Arctic raspberry, the yellow cloudberry, cranberries, and whortleberries. The tundra are the home of reindeer which in winter scratch away the snow with their hoofs to obtain the moss beneath. At this season the animals migrate to the margin of the forest zone, but in spring they move towards the Arctic Ocean while enormous flocks of birds, such as snow-geese, ptarmigan, and eider duck, fly north to nest.

The *Cold Forests* of Eurasia, together with those of North America, form a wooded girdle around the Northern Hemisphere between the tundra and the cool temperate grasslands to the south. The *taiga*, as the cold forest belt of Asia

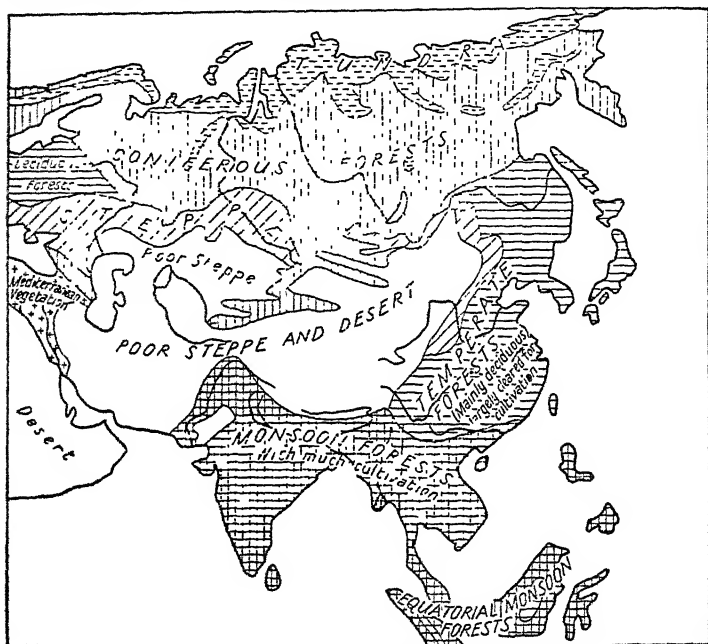


FIG. 9. Asia: Natural Vegetation

is called, which extends from Scandinavia eastward for 2,000 miles, has an average width of about 500 miles. In the north the trees are mainly conifers, such as pines, firs, spruces and, more rarely, larches. But the harsh climate, and in certain areas the light rainfall, cause many trees to be relatively small and stunted. Farther south, where the climate is less severe, poplars, willows, birches, and other deciduous trees are found, though oaks and beeches are absent. Towards the steppes the forests merge into more open woodlands.

In summer it is difficult to penetrate far into the forests owing to the tangled undergrowth and the boggy nature of much of the land. But in winter, when the ground is frozen hard, the rivers and lakes are covered with thick ice, and the snow has smoothed out the uneven surface, the trapper, on his snow-shoes, sets out seeking bears, foxes, squirrels, and other fur-bearing animals that abound in the taiga. Lumbering is being developed in the more accessible areas near the great rivers, but transport difficulties in this huge forest zone have up to the present time retarded progress.

The Steppes, as the treeless grasslands lying to the south of the cold forest belt are called, have a typical continental climate with very cold winters and hot summers. The rainfall is sufficient for grass, but except in favoured districts such as river valleys there is not enough for trees. In no other region is the seasonal contrast greater. In April the winter snows begin to melt and disappear, and before long the moistened ground is covered with flowers which deck the fresh young grass with gorgeous colours. But all too soon their beauty fades, for the summer rains are light, soon the blazing sun scorches up the pastures, and during droughts streams and waterholes dry up.

On these mid-latitude grasslands, where periods of plenty and scarcity often alternate, the animals are adapted in various ways to their environment. They live in herds: that is they are social, and this social instinct aids them in several ways. When danger threatens such animals as wild asses, the males protect the females and their young from attack. Among weaker forms, such as rats and other rodents, sentinels give warning of impending danger and so enable the animals to seek refuge in their burrows. Many of the steppe animals are migratory. Gazelles, antelopes, wild horses and asses can travel swiftly from one district to another in search of food. Other animals, as, for instance, the two-humped Bactrian camels—which store up food in their humps and water in cells in their stomachs—and sheep which

have reserves of food in their very fat rumps or tails, are able to exist on the scanty and parched pastures in times of drought.

The Arid Lands and Deserts, which extend from Arabia through Central Asia to Mongolia, are mainly a region of sandy or stony wastes and very poor steppes. No hard-and-fast line separates them from the steppes proper, and conditions of life for plant, animal, and man, though more difficult, are in essentials much the same. Here and there stretches of richer pasture are found, and valleys, watered by rivers rising amidst snow-clad mountains, form oases in an otherwise arid land. In irrigated valleys wheat, barley, millet, cotton, tobacco, and fruits are grown, but outside these fertile areas the people are mainly nomadic herdsmen.

In the *Mediterranean Lands*, on the western margin of the arid belt, the natural vegetation is adapted to withstand the summer drought. Evergreen shrubs, such as the laurel, myrtle, and arbutus, have thick hairy, oily, or wax-coated leaves which prevent undue loss of moisture. Cereals such as wheat, and olives and vines can be grown without artificial watering, but fruits, such as oranges and lemons, require irrigation.

In the *Tropical Monsoon Forests* of India and Burma, the hot wet summers with their heavy downpours of rain are followed by a dry season which usually lasts from four to six months. As the total amount of rain is less, and because it is seasonal, the monsoon forests are more open than those around the Equator, and in the dry season the trees shed their leaves. They usually grow to a height of from 40 to 100 feet, have huge crowns, thick trunks, and spreading branches. The baobab, for example, is not unlike an old gnarled oak, though it is less twisted and knotted and its bark is smoother than that of the English tree. It requires considerable space and cannot grow in crowded surroundings. Teak, one of the most valuable timber trees, is not found in close association, but is scattered in single stands throughout the forests. In some areas the undergrowth

consists of woody shrubs; in others of bamboos and other tufted grasses. As soon as the rains start the forests are at the height of their glory, for trees and shrubs burst into blossom even before their leaves appear; but during the dry season the landscape rather reminds one in some respects of an English (deciduous) woodland scene in winter.

Though possibly less rich in natural resources than the hot rain-forests, the monsoon forests are healthier and more easily cultivated. Rice, the staple food crop, is widely grown on the well-watered flood plains of the rivers. Maize and millet are typical crops, though the latter cereal is found mainly in the drier areas. In regions where the rainy season lasts for six or seven months cotton, tea, and sugar-cane are important and can be grown without artificial watering.

In the *Equatorial Monsoon Forests* of Malaya and the East Indies, where rain falls throughout the greater part of the year, the trees grow more closely than in the tropical monsoon forests of India. The products, however, are very similar. Rice is the staple food and rubber the chief cash crop. In many districts groves of coco-nut palms fringe the sandy shores. Typical too of this region are the mangrove swamps found along some low-lying coasts. The trees, which grow between tidal limits, in stinking mud and slimy ooze, spread by dropping branches to form roots. By trapping the silt brought down by rivers or carried by ocean currents they help to build up the coast-line.

Mountain Vegetation. If we were to leave the Ganges Plain and climb up the Himalayas we should pass from the monsoon forests, through deciduous and coniferous woodlands, and alpine pastures and tundra, into the region of perpetual snow which is reached at a height of about 15,000 feet.

Natural Regions

We may divide Asia into four major Natural Regions based mainly on climate which, in its turn, is greatly influenced by the relief and especially by the central mountain barrier.

1. *The Monsoon Lands* of South-East Asia include India, Indo-China, the Malay Archipelago, China, Manchukuo, and Central and Southern Japan.

2. *The Arid Lands* may be divided into (a) those of the South-West consisting of Arabia, Irak, Iran (Persia), and

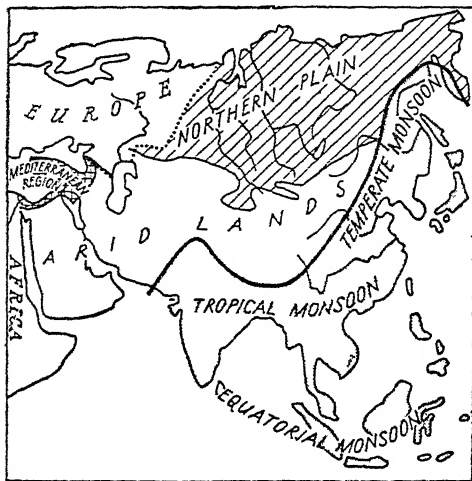


FIG. 10. Asia: Major Regions

Afghanistan, and (b) Central Asia including Chinese Central Asia and Soviet Central Asia.

3. *The Mediterranean Lands* comprising Turkey, Syria, and Palestine. Trans-Jordan may be regarded as a transitional belt between the Mediterranean Lands and Irak.

4. *The Northern Plain and the Arctic Coast-lands.*

EXERCISES

1. Select *one* of the chief vegetation belts of Asia and name some of the principal plants and animals, showing how *one* in each case is adapted to its environment.

2. In which vegetation belts is irrigation necessary for the growth of most crops? Give your reasons. In each case name some of the chief cultivated crops.

THE MONSOON LANDS

CHAPTER V

INDIA: THE LAND AND THE PEOPLE

A Sub-Continent

INDIA has been aptly termed a sub-continent, for broad and lofty mountains separate it from the rest of Asia, its size is enormous, its climate varied, and its peoples differ in race, religion, and language. The Indian Empire extends westward across the mountains to include Baluchistan, and north-west to Kashmir, the beautiful state lying amidst the ranges of the Western Himalayas. The area of India is almost 1,600,000 square miles and within its borders live some 337 million people, or about one-fifth of the human race.

Peoples of India

Little trace now remains of the original inhabitants of India who probably belonged to a small negro race. But at the dawn of history the country was inhabited by a short dark people, now called Pre-Dravidians, who were driven into the less fertile regions by invaders coming from the north-west. The latter, who were a tall, light-coloured race, possibly originating in the Mediterranean region, made their homes in the Ganges valley. Centuries later other peoples, streaming through the passes of the north-west, settled in the Indus lowlands and spread into the Ganges valley. About 1,500 B.C. successive waves of Indo-Aryan invaders from Central Asia occupied the Plain of Hindustan. More advanced than their predecessors, they gradually built up a high civilization, developing Hinduism and the philosophy, arts, and letters that were the glory of ancient India.

Meanwhile, Mongolian tribes had filtered into India and Burma from the east and had established themselves in the southern valleys of the Himalayas.

So the centuries rolled by. Then about A.D. 1000 began another series of invasions by tribes from the steppes. These peoples, who professed Islam, settled in the north-west where in the sixteenth century they established the Mogul Empire. From their capital at Delhi they advanced into the Deccan against the Mahrattas, descendants of immigrants from Central Asia who had settled in that region.

The discovery of a seaway to India by Vasco da Gama led to the founding of Portuguese, and later of British, French, and Dutch trading stations at points along the coast. The Portuguese power declined, but during the eighteenth century there was a fierce struggle between the British and French for supremacy in India. In 1858, after the Indian Mutiny, the control of India passed to the British Crown.

Apart from British and other European peoples, all the invaders of India entered the country by land, coming chiefly through the north-west passes. The present inhabitants are descended mainly from the immigrant tribes, but though they differ in origin, religion rather than race forms the basic distinction between them.

A relatively small number of the people are Buddhists, Christians, and Parsees, or fire-worshippers. But out of every 100 persons, 70 are Hindus and 21 Mohammedans.

Religions

Hinduism is the religion of one-eighth of the human race, and of one-half of the inhabitants of the British Empire. Its most striking feature is the idea of *caste*. A Hindu believes that a man is bound to the caste, or class, in which he is born. Though hundreds of subdivisions have grown up, the four great castes are the Brahmins, to which belong all the priests, though all Brahmins are not priests; the warriors; the farmers and craftsmen; and the serfs. To be 'outcast' is a great stigma, but in recent years attempts have been made to improve the lot of the outcasts, or depressed classes. If a Hindu loses his caste he may not marry within

it, and is not even allowed to join in the common meal or in the smoking of a friendly hookah, or pipe. The chief Hindu gods are Brahma, Siva, and Vishnu. Brahma, after creating the world, retired, leaving the rule and care of mankind to Siva and Vishnu. To the Hindu the cow is the most sacred of all animals, and neither cow nor bull is interfered with, even when it strolls down the bazaar and helps itself to fruit and vegetables. No Hindu will kill either of these animals, or touch or eat their flesh. Each year thousands of Hindus make pilgrimages to the Ganges, Jumna, and Godavari to bathe in their waters and secure blessings in expiation of sins. Gradually, just as religious prejudices have almost died down in England, so in India rigid caste distinctions are being broken down, especially in the towns, as the result of travel, intermarriage, and more liberal thinking.

Mohammedanism, or Islam, the other great religion of India, is strongest in the north-west and in Eastern Bengal, though followers of this religion are also found scattered throughout India amidst the Hindu population.

Languages

English, the official language, is understood by many educated people throughout India, but Hindustani is the most widely used. In Bengal, and neighbouring provinces in the North-East, some 50 million people speak Bengali. Yet, incredible as it may seem, some 222 languages are spoken in India, and the person 'who wishes to make himself generally understood in all parts of the country would have to be the master of as many separate tongues as a linguist who was prepared to accomplish the same achievement in Europe'.

Distribution of Population

Though India has great cities, such as Calcutta, Bombay, and Madras, yet nine out of every ten persons depend on the cultivation of the land for their livelihood. The most

densely peopled areas (see Fig. 11) are well-watered lowlands, like the Ganges valley and the coast-lands of Peninsular India. Next comes the Punjab, for in spite of a light rainfall this region is able to support great numbers because the tributaries of the Indus enable large areas to

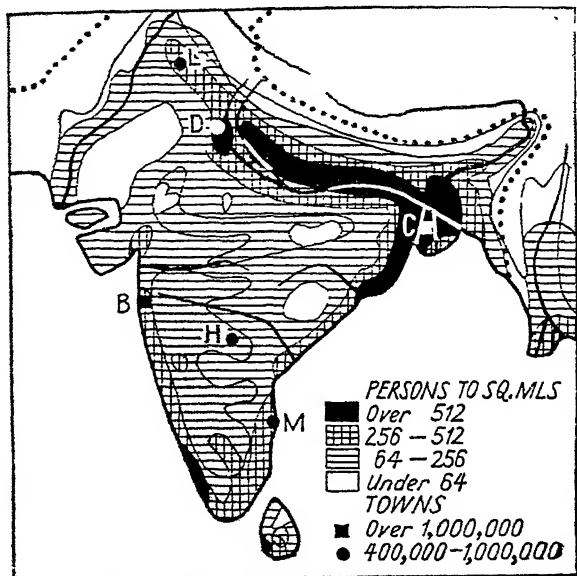


FIG. 11. India: Distribution of Population

be irrigated. Thinly populated regions include the Thar Desert which receives little rain and cannot be irrigated, and the mountainous areas where the rugged relief prohibits close settlement.

Government

India consists of (1) *British India*, which is divided into Provinces, with elected Legislatures or Parliaments; and (2) the *Indian States*. Some Provinces, such as Bombay and Madras, are larger than the British Isles. The Indian States

vary in size from Rajputana, whose area exceeds that of the British Isles, to tiny domains no bigger than an English parish. They are ruled by princes who owe allegiance to the King-Emperor, George VI, represented in India by a Viceroy, who is also Governor-General. The Central Legislature of British India consists of the Governor-General, and the Council of State, and the Legislative Assembly, both bodies being mainly elective. India has been promised full self-government in the immediate future.

Weather and Climate

Nowhere else in the world is the monsoon type of climate so well marked as in India. In no other region of similar size do so great a number of people depend for their prosperity on climatic conditions. More than three-quarters of the inhabitants of India live by agriculture, and if the monsoon rains fail or are slight, as they sometimes are in parts of the country, then millions are faced with famine.

Over the greater part of India there are three seasons.

The Cool Season lasts from October to February or March. At this season the south of India is about as warm as Italy in early summer. In the Indo-Gangetic Plain the January temperature is very similar to that of June in the south of the British Isles. Towards the end of October the winds start blowing from the high-pressure areas over the land to the low-pressure areas over the ocean. As they are blowing outwards from land to sea they are dry winds over most of India. The map (Fig. 13) shows us, however, that these winds bring rain to the south-east of India and Ceylon because in that region they flow over the Bay of Bengal before reaching the coastal areas. During the cool season the skies are cloudless and the days brilliantly sunny, while even in the rainy areas in the south-east there is usually less cloud and more sunshine than on an average summer's day in the British Isles.

The Hot Season commences in March. As the sun moves

northwards towards the Tropic of Cancer the temperature rises rapidly, the air over the land is heated, and pressure becomes lower than over the sea which, of course, takes longer to heat. Day after day the sun shines down with fierce intensity from a cloudless sky: all the vegetation is burnt up, not a single green thing is to be seen. The weather grows still hotter and by the beginning of June the heat in the plains is almost unbearable, especially to Europeans.

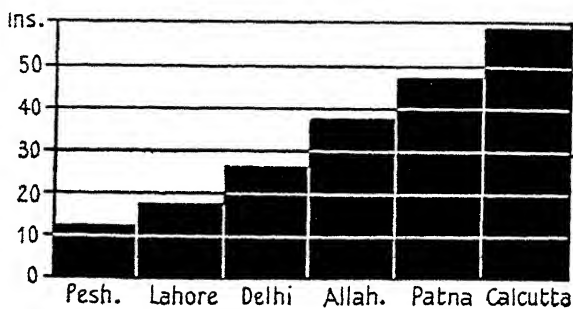


FIG. 12. India: Comparative Annual Rainfalls

There is a considerable daily range of temperature, but even the nights are hotter than very hot summer days in England. In South-West India rains begin in April and May, as they also do in Assam, where they are of great importance for the tea crop; but with these exceptions there is little rain during these months throughout India.

The Rainy Season. Towards the end of May winds from the south and west cause violent storms with heavy showers every few days. Then about the middle of June the monsoon 'bursts', rain descends in torrential downpours accompanied by thunder and lightning, and soon the parched brown earth is covered with a carpet of green as the vegetation springs to life. The south-west winds, blowing across the Arabian Sea, bring heavy rain to the windward slopes of the Western Ghats and the coast-lands at their base. But the leeward side of the Western Ghats, lying in their rain

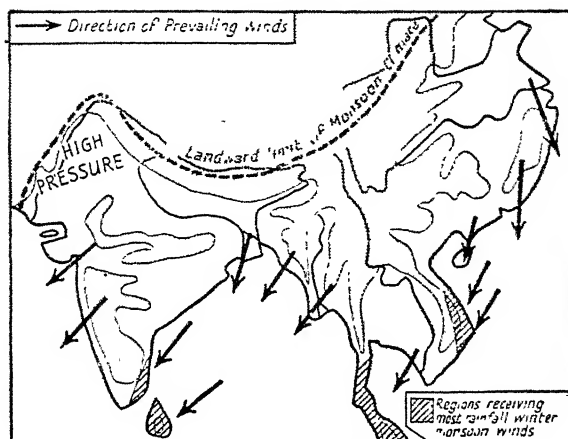


FIG. 13. Asia: The Winter Monsoon

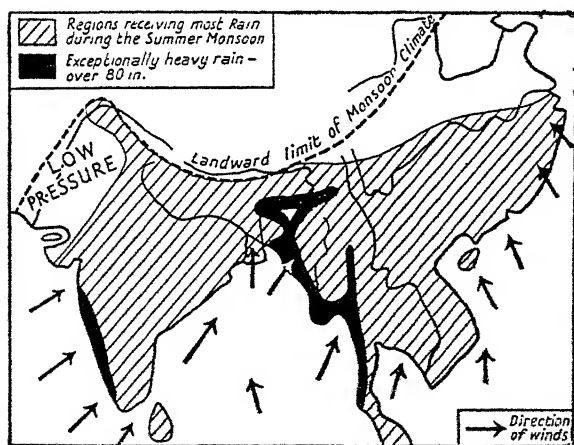


FIG. 14. Asia: The Summer Monsoon

shadow, is comparatively dry, and much of the Deccan plateau receives only a slight rainfall.

Winds, blowing over the Bay of Bengal, cause an extremely heavy rainfall on the windward slopes of Burma and Assam, while those flowing up the funnel-shaped Ganges valley bring heavy rain to the Himalayas and the plains at their base. But these winds lose their moisture as they pass up the valley, and reach North-West India comparatively dry.

The south-west winds blowing up the Indus valley are also relatively dry winds, for they have not crossed a large expanse of ocean. To the south-east of the Indus lies the Thar Desert which has a very scanty rainfall.

'After four to six weeks of heavy rain, often falling uninterruptedly for two or three days in succession, the weather clears up, and sometimes some weeks pass without further rains; after which a week or two more of wet weather brings the rainy season to a close about the end of September.'¹ Owing to the clouds the rainy season is usually somewhat cooler than the preceding hot season, but with the clearing of the skies towards the end of the rains the weather becomes warmer for a short time.

EXERCISES

1. India has three seasons. Name them and state their approximate duration. Describe the general weather conditions during *one* of them.

2. (a) At what period of the year does India receive the greater part of its rainfall? (b) Name (i) *two* regions with an exceptionally heavy rainfall, (ii) *one* with a light rainfall, and (iii) *one* with two rainy seasons. Account for the differences.

¹ Kendrew, *The Climates of the Continents* (Clarendon Press).

CHAPTER VI

REGIONS OF INDIA

WE may divide India into three major regions.

1. The Mountains of the North and North-West which consist of (*a*) the Himalayas, and (*b*) the Hindu Kush, Sulaiman, and other ranges which shut off India from the Plateau of Iran;
2. The Plain of Hindustan consisting of (*a*) the Indus Lowlands, and (*b*) the Gangetic Plain;
3. Peninsular India, or the Deccan.

The Himalayas

The Himalayas, together with the mountains of the North-West, form a mountain wall shutting off the great sub-continent of India from the rest of Asia. With their parallel fold ranges, their mighty peaks, great glaciers and wind-swept snow-fields, the Himalayas are the loftiest belt of mountains in the world. For 1,500 miles they shoot up abruptly from the Plain of Hindustan to an average elevation of some 4 miles, though giant peaks, like Everest (29,141 feet), tower to even greater heights amidst the eternal ice and snow. Between the great fold ranges lie longitudinal valleys, so deep and inaccessible that they are, for the most part, useless as routes. In the Central Himalayas, less than 50 miles apart, are the sources of two of Asia's great rivers—the Indus and the Brahmaputra.

Passes across the great mountain barrier are few and high—numbers approach 17,000 feet—and the valley routes giving access to them are difficult. Those leading up to Tibet are the only ones by which that mountain-state can carry on trade with India. One route runs from the hill-station of Darjeeling to Lhasa, the capital of Tibet. Farther west the road from Hindustan winds up to Simla, 'the

summer capital of India', set amidst pine woods and gardens, whence it continues to western Tibet.

From the Punjab the way climbs up the Jhelum valley to Srinagar, the capital of *Kashmir* (see Plate III). This high-land state, lying in the west of the Himalayas, at an elevation of from 5,000 to 7,000 feet, has a delightful climate. Its summers are somewhat warmer than those of England, and

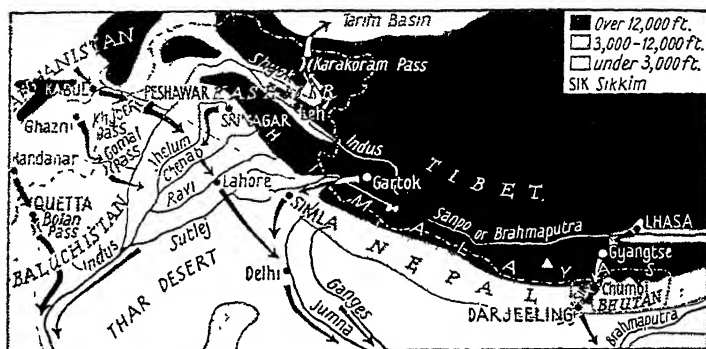


FIG. 15. Land Routes into India

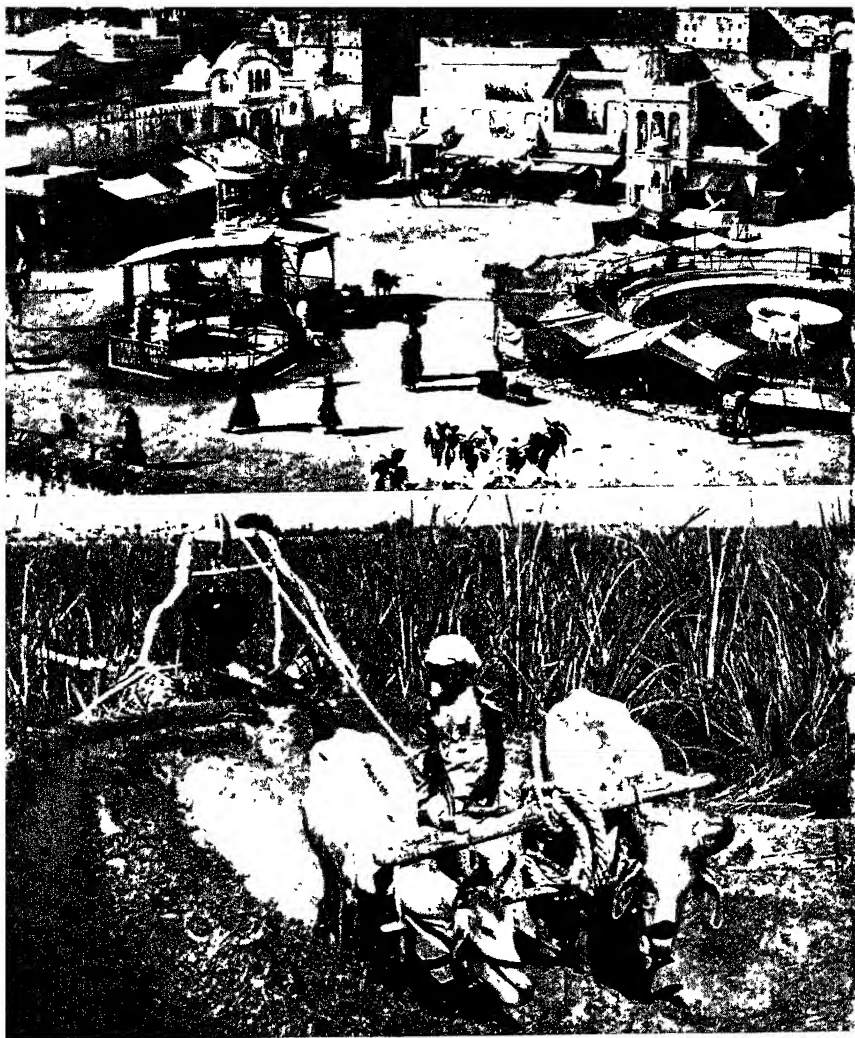
owing to its sheltered position the winters are not really severe, though for some two months the ground is usually covered with snow. Along the banks of the Jhelum, the chief highway of Kashmir, are set little villages, surrounded by wheat and paddy (rice) fields, woodlands, and pastures on which feed sheep and goats from whose wool are made the world-famous shawls and carpets. Kashmir, which is almost as large as Great Britain, ranks as one of the Native States of India, but *Nepal* and *Bhutan*, in the Central Himalayas, are independent.

Natural Vegetation and Crops. Along the base of the Himalayas extends a rain-drenched belt of unhealthy country, called the Terai, where rather open forests, containing many sâl trees, mingle with marshy jungles, and stretches covered with giant bamboos and other tufted grasses. Above 5,000 feet are cooler forests where the undergrowth



3. MOUNTAIN SCENES IN INDIA

(Above) Srinagar, capital of the mountain state of Kashmir—native boats on the Jhelum, the principal highway of the country (see p. 38). (Below) A caravan passing through the Khyber Pass, the grim defile, 33 miles long, through which most of her invaders entered India. Note the fortified Afridi village in the background (see p. 39).



4. A TOWN IN INDIA—PRIMITIVE IRRIGATION

(Above) A town in Rajputana. Note the Temple on the left. The flat-roofed houses, and the camel, remind us that this is one of the arid areas in India, and that part of this state lies in the Thar Desert. No Hindu would interfere with the cows strolling in the square. (Below) Primitive irrigation in the Gujarat. Buffaloes and oxen are also used for draught and transport purposes (see p. 44).

thins out and the trees resemble those of temperate lands. In April and May the magnolias and rhododendrons, which are about the size of English horse chestnuts, are ablaze with bloom. From 6,000 feet the chief trees are the deodar and oak, while in sheltered valleys grow apples, pears, chestnuts, evergreen oaks, laurels, and maples. Still higher up deciduous trees give way to pines and other conifers, and at about 11,000 feet these are replaced by alpine pastures that pass through tundra to the region of perpetual snow which is reached at about 18,000 feet.

In places the forest belt has been cleared. Tea of a specially good quality is grown on the hill-sides of Assam and round Darjeeling. The bushes send out new shoots in spring, and if the leaves are plucked continue to 'flush' through the summer. But the chief picking seasons are in spring and autumn, when the greatest quantities of leaves are gathered (see p. 63).

The North-West Frontier

South of the Hindu Kush the Sulaiman and Kirthar Mountains rise steeply from the Indus lowlands. This mountain wall can be crossed by three relatively easy routes—the Khyber, the Gomal, and the Bolan passes.

After leaving Lahore, in the Punjab, the Grand Trunk Road runs on to Peshawar and thence through increasingly arid country to the Khyber Pass and 'the no-man's-land' along the North-West Frontier (see Plate III). Wild and almost rainless is this arid frontier region, sun-scorched in summer, bitterly cold in winter. It is the home of fierce tribes, only partly under control, to whom might is right, and self-preservation the only law. Living in fortified villages set in isolated valleys, these primitive folk rear sheep, goats, and camels on the rough mountain pastures, and grow wheat, barley, and fruits on plots irrigated from snow-fed streams.

The grim defile of the Khyber is the most historic of all

those routes through which invading hosts entered India. Thirty-three miles long, the pass, which runs parallel to the valley of the Kabul river and is in places scarcely 12 feet wide, leads from the plains around Peshawar to Kabul, the

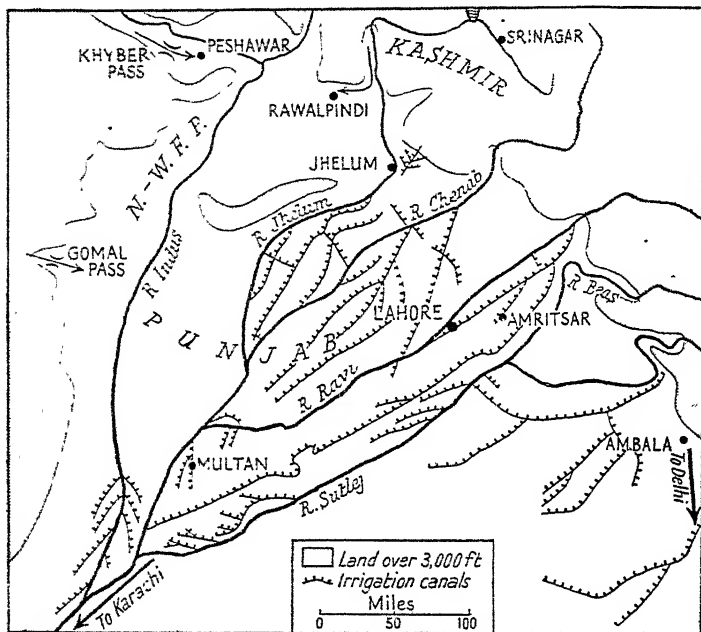


FIG. 16. The Punjab and the North-West Frontier Province

capital of the mountain state of Afghanistan. Through the rocky gorge laden camels pad their way to India carrying wool, hides, carpets, fruits, and timber from Afghanistan, while those returning are piled high with cotton goods, indigo for dyeing, sugar, and hardware.

Away to the south of the Khyber the Gomal Pass, one of the oldest trade routes in Asia, leads through Waziristan, inhabited by wild Waziri tribesmen. Between the Kirthar and Sulaiman Mountains the Bolan Pass is followed by the railway from the lower Indus lowland to *Quetta*, the capital

of British Baluchistan, whence the line continues to the frontier of Iran.

The Plain of Hindustan

Between the fold-mountains of the Himalayas and the old crust block of Peninsular India lies the great lowland, drained by the Indus and the Ganges, which forms the Plain of Hindustan. This vast depression was once an arm of the sea. Built up of sediment brought down by the mighty rivers descending from the Himalayas, and lesser streams flowing from the south, it is being constantly replenished by silt carried along by the rivers and spread over the land during floods. A low divide, scarcely 1,000 feet high, links the Himalayas with the plateau of Peninsular India, and separates the basin of the Indus from that of the Ganges.

The Indus Lowland

After leaving the Himalayas the Indus enters the Plain of the Punjab, 'the land of the five rivers', so called because it is watered by the five great tributaries of the Indus—the Jhelum, Chenab, Ravi, Beas, and Sutlej. In winter and spring the rivers trickle over broad boulder-strewn beds, but in early summer when they are swollen by melting snows from the Himalayas, they form deep, wide channels whose waters bring fertility to the thirsty land.

As the rainfall in the Indus plain is slight and evaporation great during the hot weather, the farmers depend mainly on irrigation. In districts near the foot of the mountains, where water is plentiful and relatively near the surface, supplies are raised from wells, often by means of waterwheels or other simple but effective devices. But throughout the greater part of the plains the water is obtained from irrigation canals. In the Punjab such canals have made possible the cultivation of arid lands whose area somewhat exceeds that of Wales.

From early times irrigation has been carried on in India,

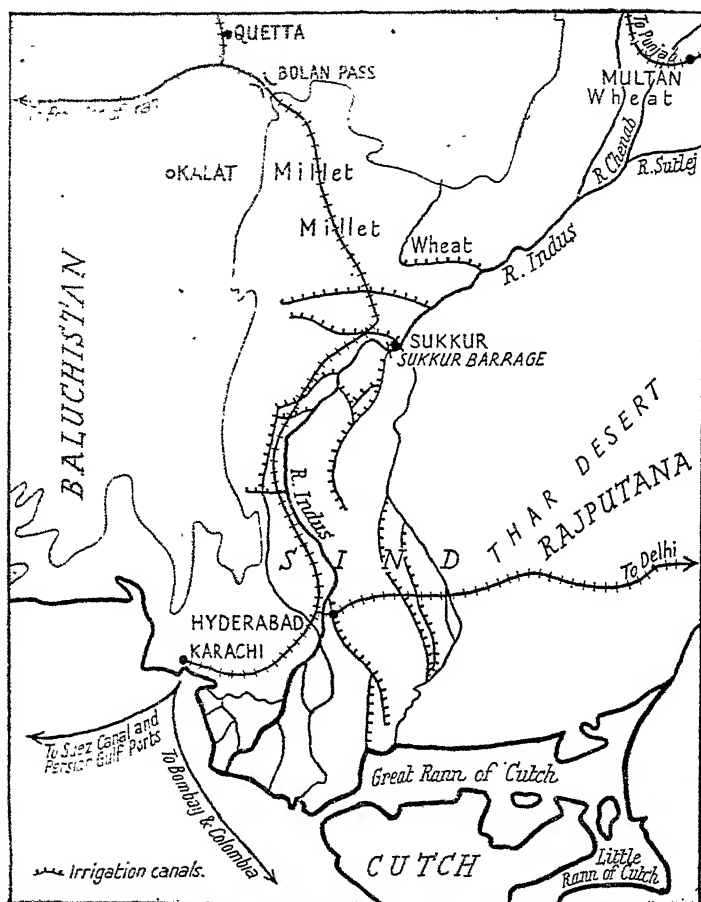


FIG. 17. The Lower Indus Valley

but the present large-scale methods are mainly due to British enterprise. In some places barrages have been built across the rivers, at points where they leave the mountains. In this way the water is stored and can be used throughout the year in canals below the barrages. This method is known

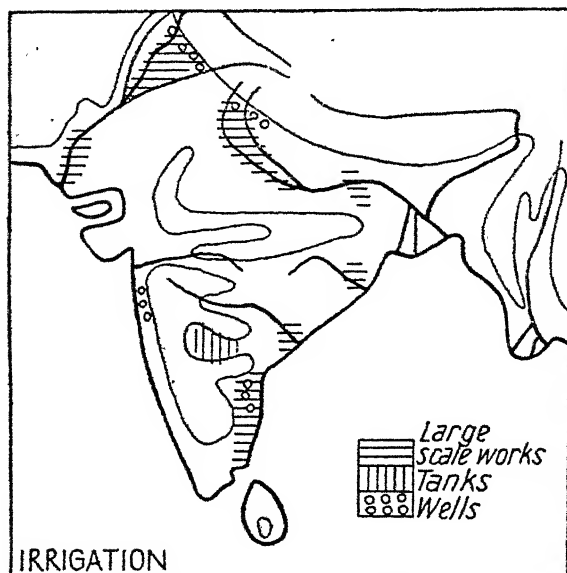


FIG. 18. India: Irrigation

as *perennial irrigation*. In order to take full advantage of the water brought down from the Himalayas, canals have been constructed (see Fig. 16) to enable the surplus waters of the Jhelum to be transferred to the Chenab, and water from the latter stream to be carried into the Ravi, whose volume is considerably less than that of either of the other two rivers.

In the lower Indus plain, where the rainfall is even less than in the Punjab, the Sukkur Dam, over a mile long, has been built across the Indus whose waters are being used to

irrigate an increasingly large area in the arid province of Sind. In some parts of the Indus plains *inundation canals* are led off direct from the rivers to enable their surplus flood waters to be employed in agriculture. But as such inundation canals cannot supply water when the rivers are low they are not available for perennial irrigation.

Most of the land produces two crops a year, the harvest times being in March, towards the end of the cool season, and in October, after the Monsoon rains. Before the coming of the rains the parched brown earth is seamed with cracks; most of the vegetation has died, and even the trees are withered and lifeless. But after the monsoon 'bursts' plants spring to life, trees burst into flower and leaf a second time, and the whole land is covered with green.

Directly the ground is moistened, either by irrigation or rain, the work of the *ryot* (peasant) begins, and it is incessant until the harvest is gathered. Humped oxen draw the wooden ploughs across the fields, and as soon as the crops appear, it is necessary to guard them from stray cattle, camels, wild pigs, and monkeys. When the cereals commence to ripen they must be protected from the hungry birds, especially flocks of parrots and flights of linnets. Night and day the bird-scarers, men and boys, sit on platforms supported by four bamboos, and drive away the birds with hard clay pellets shot from a kind of catapult. As soon as the grain is brought in from the fields it is threshed by bullocks or cows, which trample on it as they are driven round and round the clay threshing floors. The winnowing is done by throwing the mixed grain and chaff into the air, the chaff being blown away by the wind while the heavier grain falls to the floor.

Wheat, barley, most millets, pulses, and linseed, which are the chief cool-season crops, are harvested in March and April. Rainy-season crops, gathered from October to December, include cotton and sugar-cane.

Lahore, the capital of the Punjab, stands on the Ravi. To

its flour mills wheat is brought to be ground; to the factories come bales of cotton grown on the irrigated plain; in its refineries seeds are pressed for oil; and here, too, candles, soap, saddles, and shoes are manufactured. Lahore is an important railway junction whence lines run north-east to *Amritsar*; south-east to Delhi; north-west to *Peshawar*; and down the Ravi valley through *Multan*, a wheat-collecting centre, to *Karachi*. Lying to the west of the Indus delta, Karachi is the outlet for the whole of the basin. It is the nearest Indian port to Europe and an airport on the route from Britain to Singapore, Australia, and the Far East. Its modern harbour has recently been enlarged to cope with the increasing trade following the extension of irrigation in Sind. In April much wheat is shipped aboard outgoing vessels, for the city is the chief grain-exporting port, and an important cotton-exporting port.

The Ganges Plain

The Ganges Lowland, with its rich alluvial soil, summer rains, and high temperatures, is the most densely peopled part of India. From early times the valley has been so intensively cultivated that the original vegetation has disappeared, except in the Sundarbans where the impenetrable jungles and mangrove swamps of the delta have hitherto almost defied Man's attempts at cultivation.

In the plain the crops are many and varied. The lower part of the valley, with its very heavy summer rainfall, is the world's chief jute-growing area, as well as one of its foremost rice-producing regions. Millions of acres of embanked and flooded fields are planted with rice: two or even three crops a year are grown, but so great is the demand that though much rice is also produced under similar conditions in other parts of India, there is little surplus for export.

Sown in March or April on marshy lowlands, jute grows rapidly, soon reaching a height of some 10 feet. After it has been cut in July, the tough, fibrous plants are first retted

(like flax), and then crushed. The fibre when spun is woven into a coarse cloth used chiefly in making sailcloth and the sacks in which grain and other produce are exported. So much jute is grown in Bengal that in spite of the enormous quantity required by local mills a large amount is available for export. In the Doab,¹ the district between the Ganges

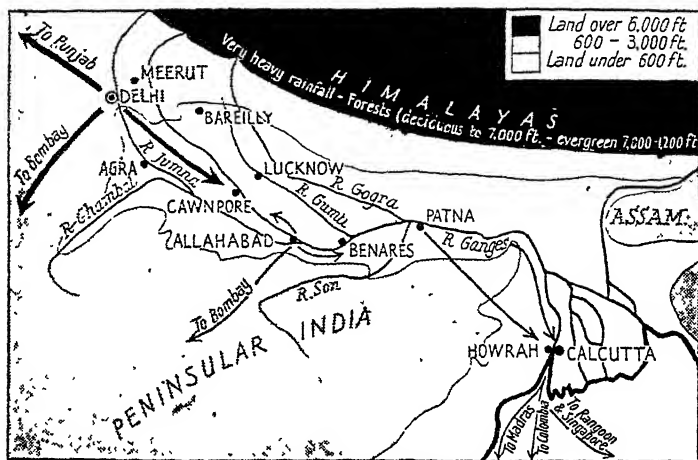


FIG. 19. The Ganges Plain

and the Jumna, where there are many large-scale irrigation works, wheat is the chief crop of the cool season, and sugar-cane of the rainy season. India grows more sugar than any other country in the world, but taken as a whole the crop is not of a particularly high quality and the bulk is consumed within the country.

The Ganges plain, which has a length of roughly 1,000 miles and a breadth varying from 200 to 300 miles, is absolutely flat. As one travels up the valley the atmosphere becomes drier, and the green of swampy paddy fields passes into a browner landscape. In the hot season each village shows up under the pitiless rays of the sun as a dark mass

¹ Doab = the land between two rivers.

which blends with the plain itself; for the huts have been built of clay dug from partly dried-up ponds that lie, surrounded by a few parched trees, on the outskirts of the settlements. Many of the villages are roughly circular in shape and are surrounded by walls, dating from less peace-

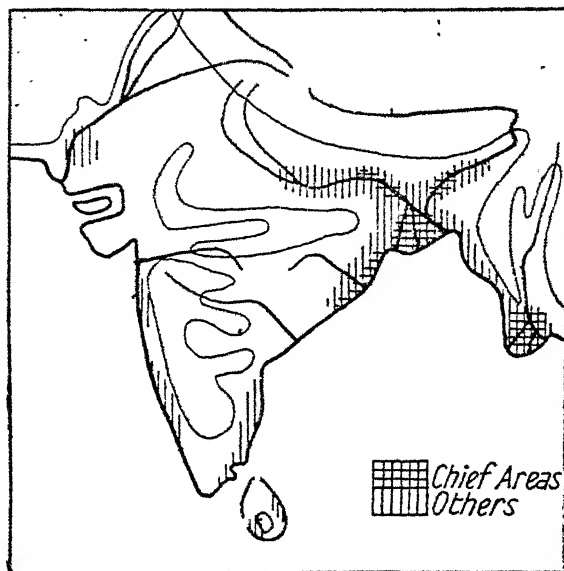


FIG. 20. *India: Distribution of Rice*

ful times, made by joining hut to hut. Even the kind of dwelling is determined by the climatic conditions. Those in the north-west, where the rainfall is less than lower down the valley, have flat roofs. In Bengal the thatch-roofed, hog-backed huts of the peasants have been built to resist the monsoon winds. Rough straggling tracks link the villages, the majority of which lie far from a main road or a railway. In these villages live most of the people, and though there are large cities and towns on the banks of the Ganges and its tributaries, yet considering the vast size of the lowland they are relatively few.

Delhi, the capital of India, is a great railway junction almost equidistant from Calcutta, Bombay, and Karachi. This historic city, standing on the right bank of the Jumna, lies athwart the route from the Indus lowland to that of the Ganges which passes between the Thar Desert to the south and the Himalayas to the north. New Delhi, the seat of the Government, lies some miles south of Old Delhi with its narrow crowded streets lined with native shops, close-packed houses, palaces, Hindu temples, and mosques. On the Jumna, too, is *Agra*, famous for the Taj Mahal, one of the most beautiful buildings in the world.

The railway runs down the valley through *Cawnpore*, with cotton, flour, and jute mills, to *Allahabad*, at the confluence of the Ganges and the Jumna, whence one line branches south-west to Bombay and another north-east to *Lucknow*. Farther down the Ganges, standing on the high left bank of the river is *Benares*, one of the oldest cities in India and the Holy City of the Hindus. *Patna* is placed where the valley of the Son from the south-west and that of the Gogra from the north-west meet that of the main stream. *Calcutta* is somewhat more than 80 miles up the Hugli distributary of the Ganges. As its hinterland stretches beyond the productive and densely peopled Ganges valley north-east to the tea-producing state of Assam, and west to the coal- and iron-mining district of the North-East Deccan, Calcutta has become the largest city in India and its chief port. It is linked by rail with all parts of the country and by air with the chief Indian cities, as well as those of Europe, the Far East, and Australia. Together with *Howrah*, on the opposite bank of the Hugli, it is a great industrial centre with jute, rice, cotton, and flour mills.

Peninsular India or the Deccan

The greater part of Peninsular India is occupied by the old crust block of the Deccan. On the west the edge of this tableland is formed by the Western Ghats which rise by

steep escarpments from the narrow plains of the Malabar Coast. On the east the plateau descends by long gradual slopes to the wider lowlands of the sandy, surf-beaten, and harbourless Coromandel Coast.

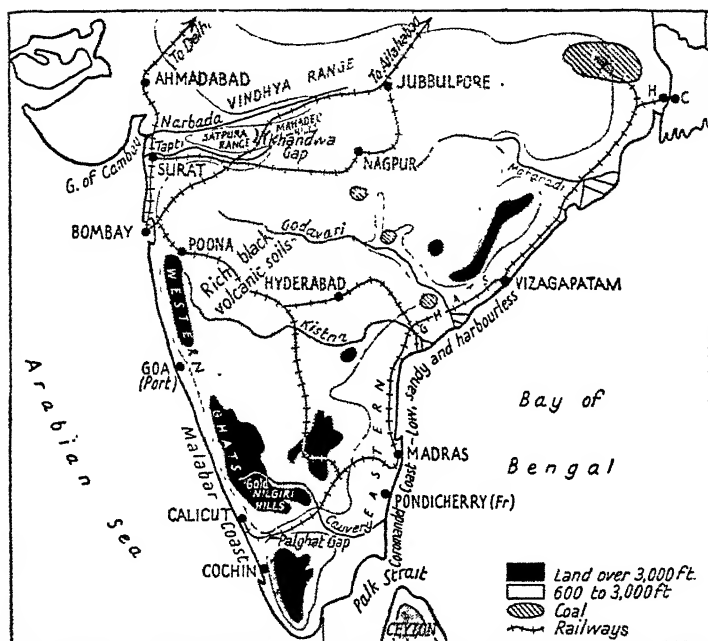


FIG. 21. Peninsular India

Towards the north of the Western Ghats, the Nerbada and Tapi flow west across the plateau to the Arabian Sea. But with these exceptions, the longer rivers of the Deccan, the Mahanadi, Godavari, Kistna, and Cauvery, flow east following the general slope of the plateau. In their upper courses they speed through deep inaccessible gorges, descending by falls, some of which, like those of the short, swift streams pouring down the Western Ghats, have been harnessed for hydro-electric power. In their lowland

courses the rivers flowing into the Bay of Bengal have built up deltas, at the heads of which dams have been constructed to hold back water for irrigation purposes.

Most of the Deccan consists of old hard rocks, but in the north-west the older formations are covered to a great depth with lavas, which during periods of volcanic activity welled up through enormous fissures in the earth's surface. These basaltic rocks have weathered to form a rich black soil retentive of moisture.

Owing to the heavy summer rains the windward slopes of the Western Ghats and the lowlands at their base are thickly forested. But along the Coromandel Coast, where the rainfall is less, long stretches are clad with more open jungle, which in the deltas gives way to irrigated lands, usually planted with rice.

The north-west of the Deccan is the chief cotton-producing area in India. As the deep black basaltic soils hold the moisture from the rains irrigation is unnecessary; but the land is heavy and the 'going' so hard that often six yoke of oxen are needed to draw the lumbering ploughs used to break up the heavy clods. Before sunrise the people are at work in the fields, even the children doing their little share from morning till night. Weeding and picking cotton under a burning sun may not be strenuous work, but it is tedious and fatiguing. Labour is plentiful and cheap in India, but living is also cheap, and it is difficult to make comparisons of wages and hours with those of European countries.

Apart from food products, cotton is India's chief cash crop. On the Deccan the cotton is of the short-staple variety and is not of a particularly high quality, but medium-staple American cottons, which have longer fibres, have been introduced into the Punjab.

In the drier parts of the Deccan, such as those lying in the rain-shadow of the Western Ghats, millet, ground-nuts, and oil seeds (linseed, castor, and sesame) are widely cultivated. Millet is an important food crop. The seed is ground

into flour; the stalks provide fodder for cattle; the straw is used for making fences, and when plastered with mud yields material for building the huts. The oil obtained from linseed and similar seeds, while still used for lighting and heating, is now much produced for export, being greatly in

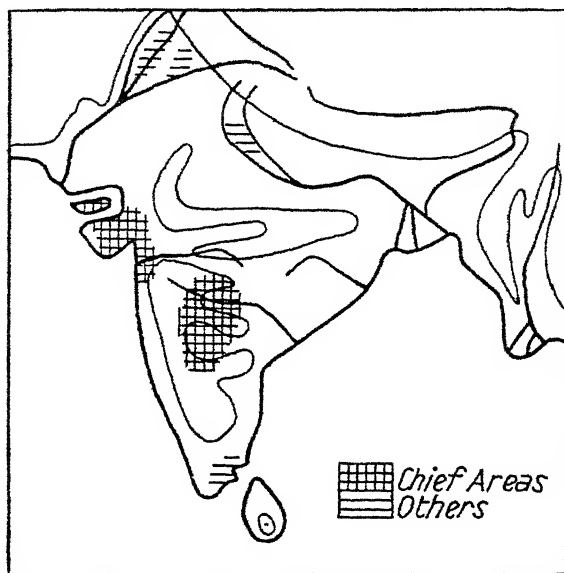


FIG. 22. India: Distribution of Cotton

demand by manufacturers of soap and margarine. Coffee is cultivated on the slopes of the Nilgiri Hills and tobacco in the south of the Peninsula.

The construction of the Lloyd Dam, south of Poona, and the Krishnarajasagara and Mettur Dams, on the Cauvery river, have enabled large areas to be brought under perennial irrigation. But in most parts of the Plateau water for this purpose is obtained from *tanks*, which are reservoirs varying in size from ponds to lakes several square miles in area. They are made by building mud dams across the

valleys of small streams depending for their water mainly on the monsoon rains.

Minerals

Most of India's minerals are found in Peninsular India. Iron ores are widely distributed throughout the Deccan, and coal of a rather low grade is mined. The principal *coal-field* lies to the north-west of Calcutta, where Ranigang and Jharia are the chief centres. The field supplies fuel and iron-ore for the important iron-and-steel works at *Jamshedpur*, and fuel for the jute factories at Calcutta. Coal is also mined in the native state of *Hyderabad*, whose capital, Hyderabad, is the fourth largest city in India. Throughout the country the consumption of coal is relatively small as owing to the warm climate it is seldom used for heating, and rarely, if ever, for domestic purposes. As large-scale manufacturing is only in its infancy no great amount of coal is needed for factories. Manganese ore, required for making certain high-quality steels, is mined in the Central Provinces and Madras; and gold in Mysore where the machinery in the mines is electrically driven with hydro-electric power from the Krishnarajasagara Dam. Salt, one of the most valuable and useful mineral products of India, is obtained along the coasts by evaporating sea-water.

Towns of Peninsular India

Bombay, the gateway of the Deccan and many would say of India herself, is situated on an island beside the only natural deep-water harbour on the west coast. It has a population of over a million, and is the second largest city in the country. With the opening of the Suez Canal, Bombay became the second nearest Indian seaport to Europe and Britain, and since then it has rapidly grown in importance. As its hinterland includes the cotton-growing area of the Deccan, the city is the chief port both for the export and manufacture of cotton. Road and railway zigzag up the steep escarpment of the Western Ghats to the tableland

beyond, where the railway divides. One line runs south-east through *Poona* to Madras; the other goes north-east to the Tapti valley where the branch to Calcutta continues up the valley to *Nagpur*. Another line from Bombay runs through the Khandwa Gap to *Jubbulpore*, a town with railway works and cotton mills, and thence to Allahabad. The railway from Bombay to Delhi runs north along the coast through *Surat* to *Ahmadabad*, a cotton-manufacturing town

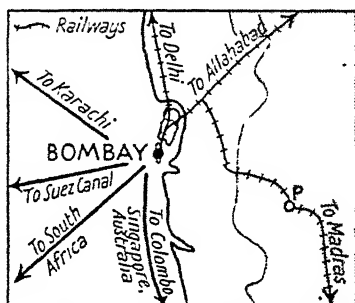


FIG. 23. Site of Bombay

picturesquely placed at the head of the Gulf of Cambay.

On the Coromandel Coast lies *Madras*, the third city in India and the capital of the Madras Presidency. Though the harbour is sheltered by two breakwaters it is not sufficiently protected to provide really good accommodation, and when the hoisted storm-cone gives warning of the approach of the monsoon, shipping leaves its anchorage and speeding through the narrow entrance seeks safety in the open sea. To the south of Madras lies the French possession of *Pondicherry*. From Madras a railway runs along the east coast to Calcutta, passing through the recently constructed port of *Vizagapatam* which commands a gap in the Eastern Ghats.

Another line runs west across the Plateau, and, traversing the Palghat Gap between the Nilgiri and Anaimalai Hills, descends to *Calicut* which has an export trade in coffee.

The small Portuguese territory of *Goa* lies midway between Calicut and Bombay. *Cochin*, south of Calicut, is a port of growing importance.

EXERCISES

1. Name *three* important cool-season crops, and *three* important rainy-season crops. Name *one* area where each is widely grown. Describe the conditions necessary for the large-scale production of *two* of them.

2. Draw sketch-maps to show why (a) Karachi, and (b) Calcutta are important ports. In each case name *two* leading exports and say from whence they are obtained.

3. *In India the term 'hut' or 'house' covers a variety of dwellings including portable screens of bamboo matting; thatched and mat-walled huts sometimes built on piles and sometimes in trees; the thatched-roofed, hog-backed huts of the Bengal peasants; those with steeply pitched tiled roofs found along parts of the west coast; and the mud-walled, flat-roofed houses of the Punjab.* Account for the type of dwelling found in (i) Bengal, (ii) along parts of the west coast, and (iii) the Punjab.

4. With the aid of your atlas, give an account of a railway journey from Lahore to Madras. Describe the scenery and the occupations of the people in the regions through which you pass. Name six of the chief towns *en route*. Illustrate your answer by a sketch-map.

CHAPTER VII

INDIA: MANUFACTURE, TRANSPORT, AND
TRADE**Manufacturing**

WITH some notable exceptions, large-scale manufacturing is relatively unimportant in India, but this is not surprising in a country where most of the people live in villages and earn their living on the land. Throughout India handicrafts and simple manufactures are carried on in much the same way as they have been for centuries, and such handicrafts absorb far more workers than do the big factory industries. In most villages the women spin cotton on their wheels and weave it into cloth on handlooms, for cotton is the chief fibre crop and *saris* and other garments made from it are universally worn. Silk being a luxury is not widely manufactured, neither is wool except in highland regions, like Kashmir, for the climate makes warm clothes unnecessary. The rather coarse wool obtained from the fleeces of goats and sheep is used for weaving carpets and rough blankets. Other simple manufactures comprise the making of pottery and leather goods, such as water-skins, saddles, harness, and shoes; and metal working which includes making hoes, scythes, brass cooking utensils, and ornaments. The potters are most numerous in districts where water for irrigation is drawn from wells, for they have to fashion the earthen vessels used on the 'Persian' water-wheels. There are more potters in Hindu than in Mohammedan villages, as the Hindu religion forbids an earthen vessel to be used twice for food.

The making of cotton goods is the leading large-scale manufacture. Over a quarter of a million people are employed in the great cotton mills of Bombay, the leading city in India both for the manufacture and the export of cotton

Calcutta is the world's chief jute-manufacturing centre, and along the banks of the Hugli, for many miles, stretch the tall chimneys of its jute factories which give employment to as many workers as do the mills of Bombay. One of the main occupations associated with agriculture is the tea in-

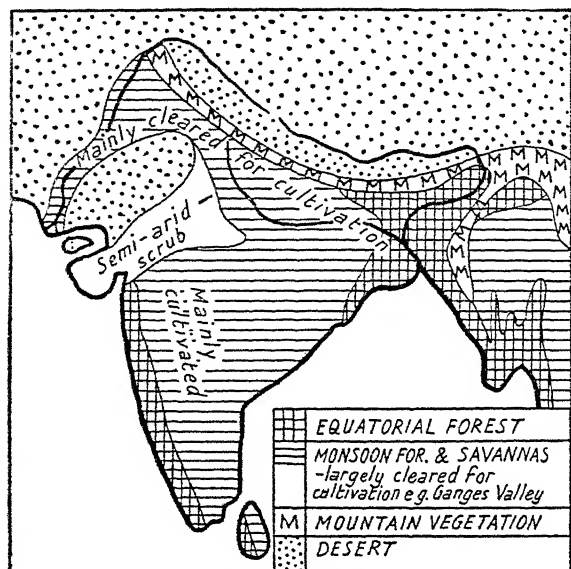


FIG. 24. India: Vegetation

dustry, which provides work for about 850,000 people, more than half of whom are employed in the factories of Assam. Others work in sugar and oil (vegetable) refineries, in flour mills, and in the great Tata iron-and-steel works at Jamshedpur.

Transport

India's rivers are little used for transport. Though the Ganges and Indus rank among the world's great waterways, they have ceased to carry much traffic since railways traversed their valleys. India is one of the few countries in Asia with

a good system of roads, whose chief value is as feeders for the railways. Since 1853, when railway construction was begun in India, some 43,000 miles of tracks have been laid

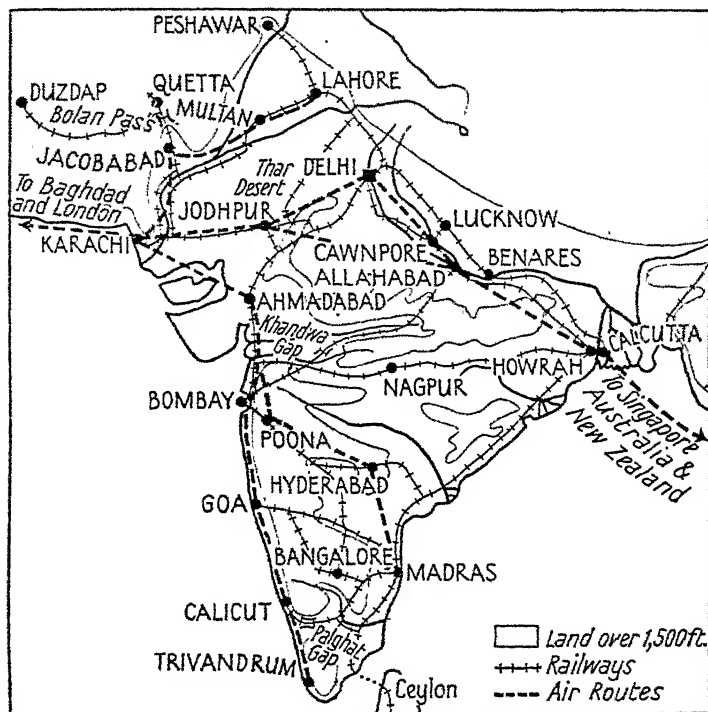


FIG. 25. India: Railways and Air Routes

down. Study the railway map (Fig. 25) with the aid of your atlas and note how the direction of the chief lines is influenced by the relief of the country. The outline of the system is best remembered if related to Delhi, Lahore, and other great inland centres, and to the four great ports of Calcutta, the outlet for the Ganges basin; Bombay, the chief port of the Deccan; Madras, the principal port in the south-

east area; and Karachi, through which passes the overseas trade of the Indus plains.

Air transport is being rapidly developed. Karachi and Calcutta lie on the British Overseas Airways route to Singapore and Australia; while internal services link Karachi with Lahore, Delhi, Bombay, Madras, and intermediate towns.

Trade

Apart from tea and wheat, India exports few foodstuffs. Her chief exports are raw cotton and raw and manufactured



FIG. 26. Comparative Output of Cattle from leading Countries. 1. British India; 2. U.S.A.; 3. U.S.S.R.; 4. Argentine; 5. Germany; 6. France; 7. Australia; 8. South Africa

jute. Almost half the raw cotton is sent to Japan, some to China, and in normal times to Germany and Belgium, but little finds its way to Lancashire, as it is not well suited for making the high-grade cloths for which that English county is famous. Much of the raw jute is sent to Great Britain (Dundee), but considerable quantities of gunny cloth (coarse sacking) are exported to the United States, and sacks are shipped to Australia. Tea is the third most important export, the bulk being sent to Great Britain. Other exports are oil-seeds (including linseed), of which Great Britain takes a large proportion, hides, and skins. Unlike Burma, India exports little rice as most of the crop is required for home consumption.

The principal imports are manufactured goods, which fact is itself an indication of the undeveloped state of manufacturing in India. The chief are cotton goods, imported mainly from Lancashire, and also from Japan, which

supplies quantities of the cheaper varieties, metals, ores, and machinery. In spite of the vast production of sugarcane, the home supply is insufficient and much is obtained from Java. India imports few luxuries as the majority of the people, whose average income is little more than sixpence a day, can scarcely find enough money for necessities.

FOREIGN TRADE OF INDIA			
EXPORTS		IMPORTS	
Jute, raw & manuf.	██████████	Cotton Goods	██████████
Raw Cotton	██████████	Machinery	██████████
Tea	██████████	Metals & Ores	██████████
Rice	██████████	Oils	██████████
Oil Seeds	██████████	Motor Vehicles	██████████

FIG. 27.

FOREIGN TRADE OF INDIA BY COUNTRIES		
INDIAN IMPORTS	COUNTRY	INDIAN EXPORTS
██████████	UNITED KINGDOM	██████████
██████████	JAPAN	██████████
██████████	UNITED STATES	██████████
██████████	GERMANY	██████████
██████████	FRANCE	██████████

FIG. 28.

India buys about one-third of her imports from Great Britain who is also her best customer, the balance of trade between the two countries being remarkably even. Japan ranks second both as an importer and an exporter. Germany and the United States come third on the import list, but of these two countries the United States is by far the better customer of India mainly because she requires an enormous quantity of gunny cloth for wrapping cotton bales. Next in order of importance, both as importers and exporters to India, are Italy, Belgium, and Australia.

EXERCISES

1. (a) Name some of the chief handicrafts and simple manufactures carried on in the Indian villages and show how they are related to the everyday needs of the people. (b) Name *three* different large-scale manufactures carried on in India. For each industry describe the position of the most important centres of manufacture and account for their position. In each case name *one* important port of export.

2. *Either* describe a railway journey from Calcutta to Peshawar, *or* a journey by air from Madras to Lahore. In either case describe the type of country traversed and give some account of the chief towns *en route*.

CHAPTER VIII

CEYLON

CEYLON is about as large as Eire, but has almost twice the population. It is a Crown Colony, and quite independent of India. Situated almost in the centre of the Indian Ocean, the island lies off the south-east coast of India from which it is separated by Palk Strait. This sheet of water, 22 miles wide, crossed by a chain of islands, called Adam's Bridge, is too shallow for steamers, which go round the south of Ceylon. Railways run to both ends of Palk Strait across which communication is provided by a ferry service.

Actually Ceylon is a detached portion of the Deccan, and in general its rocks resemble those of Southern India. The mountainous central portion of the island, known as 'The Hill Country', is surrounded by coastal plains. As Ceylon lies nearer to the Equator than India, it has a hot climate with little range of temperature, though owing to its elevation the Hill Country is cooler and healthier than the lowlands. The seasons are determined by the monsoons. The South-West Monsoon, which blows from April to September, brings rain to the south-west. The North-East Monsoon, which prevails between October and March, brings rain at first to the whole island, but as it slackens it affects the eastern side only. The hot wet climate favours the growth of forests. At one time the whole island was thickly wooded, but extensive areas have been cleared and nearly one-fifth of it is now cultivated.

The Hill Country

The Hill Country, or mountainous region, consists of lofty and much-weathered uplands whose old hard rocks yield plumbago (graphite), used in the manufacture of

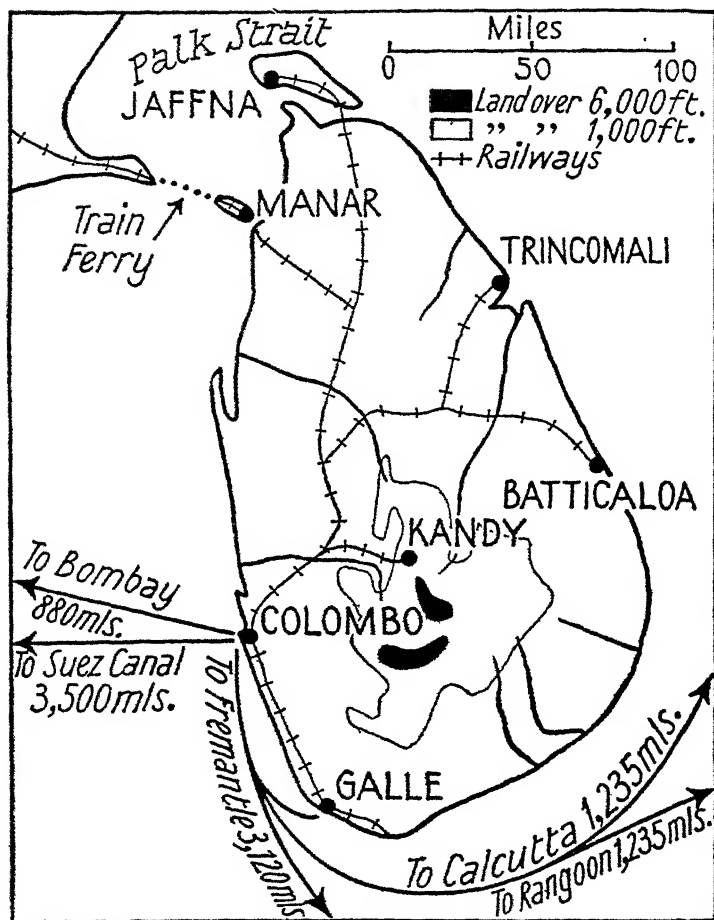


FIG. 29. Ceylon

pencils; sapphires, rubies, and other gem stones which are obtained from numerous small quarries. The swift streams descending from the highlands are of little use for navigation, but their waters are used for irrigation especially in their lower courses.

Tea and rubber, Ceylon's chief cash crops, are cultivated on well-watered but well-drained slopes in the south and south-west. The *tea* shrubs are planted in rows, and on

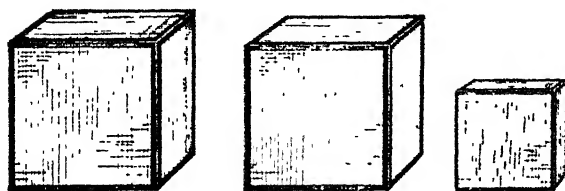


FIG. 30. Comparative Production of Tea from the three principal tea-exporting countries: 1. India; 2. Ceylon; 3. China

many estates the ground between them is sown with a cover-crop to prevent the surface soil being washed away by the heavy rains. The shrubs are ready for picking when about three years old, but do not reach their full yield until their sixth or seventh year. Most of the pluckers are women who, using both hands, gather as many as 30,000 shoots a day, picking the leaves with their long slender fingers and throwing them over their shoulders into baskets slung on their backs. The two young leaves at the top of the stem, together with the bud, yield the finest tea. As a rule plucking is carried out every ten days, and there are a number of pluckings in a season. After the leaves have been withered, they are rolled to give them their characteristic twist and break up the oil cells. Later they are exposed to currents of hot air, during which process they become thoroughly dry and black. The 'made' tea is passed through sieves which sort it into grades, after which it is packed by machinery in wooden chests, usually lined with aluminium foil for

protection against atmospheric conditions. Ox-carts haul the chests along the country roads to the railway stations whence they are dispatched to Colombo, one of the chief tea-exporting ports of the world.

Kandy, the former capital of Ceylon, situated in the Hill Country, and linked by rail with Colombo, is famous for its Buddhist temples.

The Coastal Plains

The Coastal Plains are widest in the north where, however, the porous limestone soil rapidly absorbs the moisture from the rains. Hence, in this part of the island extensive areas are covered with scrub, and agriculture is mainly confined to districts irrigated from tanks. Jaffna is the chief port in the north. Apart from the northern district the lowlands are well watered and fertile.

Long stretches of coast are margined by sandy strands dotted with coconut palms whose thin scarred trunks, bending towards the sapphire sea, are crowned with feathery leaves amidst which hang the nuts. Almost every valley has its coconut groves, and nearly every house has its garden of palms whose fruit provides the owner with a welcome addition to his income. The nuts yield copra, coconut oil, desiccated coconut, and coir. Rice is widely cultivated on the lowlands, but it is insufficient for local needs and much is imported from Burma.

Colombo, the capital and chief port of Ceylon, lies in the south-west of the island on a fine artificial harbour which provides shelter from the South-West Monsoon. Owing to its central position in the Indian Ocean it is the most important port of call for steamers travelling from Europe, via the Suez Canal, to Calcutta, Singapore, the Far East, and Australia. Hence Colombo is a great entrepôt port, collecting and re-exporting tea, coconut products, rubber, cacao, graphite, and cinnamon from Ceylon, as well as products from Southern India.

Galle, once the principal port of Ceylon, is now relatively unimportant: so too is *Trincomali*, on a magnificent harbour on the east coast, but though it lies off the beaten track and is not a commercial port, it is a naval and air base.

The People

The Veddas, the earliest-known inhabitants of Ceylon, were conquered by the more advanced Sinhalese, agricultural people who irrigated the land from water stored







FOREIGN TRADE OF CEYLON			
EXPORTS		IMPORTS	
Tea		Rice	
Coconut Products		Cotton Goods	
Rest		Coal & Coke	

FIG. 31.

in tanks (see p. 51). Later, Tamils from South India settled in the north where live their descendants, known as Jaffna Tamils to distinguish them from immigrant Tamil coolies who come from India to work on the plantations. After the Sinhalese had been driven out from the north they settled in the wetter south. To-day they are the most numerous race in Ceylon, being divided into the 'Low Country' folk living on the plains in the west and south, and the 'Kandyans' who inhabit the Hill Country. In Colombo and many of the larger towns the traders are Moormen, descendants of Arabs who married Tamil women. The Sinhalese are Buddhists, the Tamils profess Hinduism, and the Moormen are Moslems.

EXERCISES

1. (a) What is an entrepôt port?
- (b) Draw a sketch-map to show why Colombo is an important entrepôt port.
- (c) Name *four* important products exported from Colombo.

2. Ceylon is famous for its tea.

(a) Why is the climate of Ceylon well suited to the cultivation of this crop?

(b) On what part of the tree are the best leaves found?

(c) Name *three* processes the leaves undergo after they have been plucked.

(d) In what are they packed?

(e) How are they conveyed from the plantations to the railway?

(f) From what port are they exported?

CHAPTER IX

INDO-CHINA

FROM the eastern end of the Himalayas lines of fold mountains separated by deep valleys run in a southerly direction into Indo-China. The most westerly of the ranges forms the Arakan Yoma of Burma which margins the Irrawaddy valley on the west. East of this valley the Salween flows across the Shan Plateau, while still farther east the Menam and Mekong drain to the South China Sea. In their mountain tracks the great rivers speed through deep gorges difficult to penetrate, but in their lower courses they have built up alluvial lowlands and huge deltas. Isolated from each other by lofty forested mountains, the lowlands became independent states, but of these Thailand (Siam) alone is now governed by native rulers, for Burma is under British control and the rest of Indo-China is French.

The South-West Monsoon brings rain to most of Indo-China from May to October, but the succeeding months are drier, especially December and January.

Burma

Burma, formerly a province of India, became in 1937 a separate state within the British Empire. The country, which is about three times the size of Great Britain, has a population of approximately 14½ millions, most of whom are of Mongolian stock. *Lower Burma* consists of the deltas and alluvial plains of the lower Irrawaddy, Sittang, and Salween. To the west the *Arakan* and *Tenasserim coastal regions* front the Bay of Bengal. The Irrawaddy forms an important route leading to the mountainous region of *Upper Burma*, while to the east rises the *Shan Plateau* (the Shan States) drained by the Salween.

The valleys and deltas of Lower Burma, and the lowlands

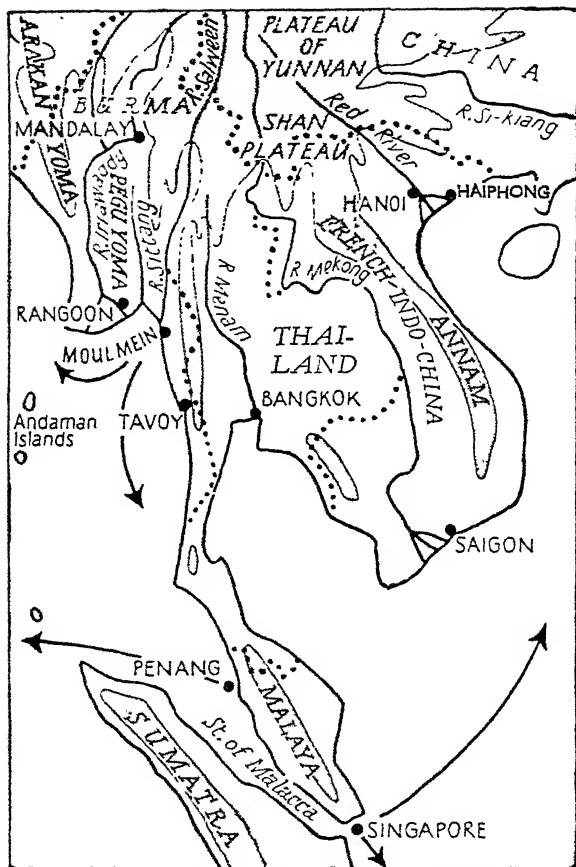


FIG. 32. The Peninsula of Indo-China and Malaya

The arrows show the direction of important shipping routes. (1) Consult your atlas and find out how far it is to the nearest British ports, by the routes indicated, from (a) Singapore, and (b) Penang. (2) Name one important product which might be shipped to Britain from (a) Singapore, (b) Penang, and (c) Rangoon.

along the Arakan and Tenasserim coast regions, are famous for their paddy fields where enough rice is grown to supply the requirements of the country and to provide a surplus for export. Much tobacco, sugar-cane, and cotton are cultivated in Lower Burma.

The most valuable timber in the huge forests is *teak*. The trees grow in single stands, and a forest of 10,000 square miles may be capable of yielding only 8,000 trees a year. When a tree is selected for felling a ring is cut through the bark around the base in order to kill it. It is then left to dry for three years, otherwise it would be too heavy to float down-stream. Felling takes place early in the year when elephants haul the logs to the almost dried-up streams to await the coming of the rains. Then, as the rivers rise rapidly, the logs begin to float and in less than twenty-four hours they have started on their long journey to the saw mills. Enormous logs bob and dance about like so many corks, and as they crash against each other a noise like thunder is heard above the roaring waters. Then suddenly there is a jam and soon a sagacious elephant wades into the swirling stream. Pulling here and pushing there he finds the key log, releases it and draws aside as the piled-up mass of timber resumes its mad career.

On reaching a main stream, like the Irrawaddy, the logs are caught and made into rafts, each having a crew of four men, which float down the broad river to Rangoon. Guided by tugs through the shipping of the port they are finally caught by booms and hauled by elephants up the muddy banks to the saw mills, where after a journey of six or seven months these large-girthed monsters of the monsoon forests are converted into beams and planks. In Burma and India much teak is used for building houses and boats, but the finest timber is exported for use in shipyards in many parts of the world.

Petroleum and some coal are found in the middle Irrawaddy valley. In the north of the Shan Plateau lead and

silver are mined and rubies quarried. Wolfram, a substance used in small quantities to give additional hardness to steel, is found near Tavoy, on the Tenasserim coast, and tin is mined in this area and near Mandalay.

Its timber yards, the smoke-wreathed, close-clustered stacks of its oil refineries and cotton mills, and the shipping in the port, all testify to the importance of *Rangoon*, the capital of Burma, which stands on a distributary of the Irrawaddy. But of all the buildings in the city, the most notable is the Shwé Dagon (Golden Pagoda) the most celebrated Buddhist temple in Burma, which reminds the onlooker that the Burmese in the main are Buddhists and that there is scarcely a village or town in the country without its Pagoda, the centre of its religious life.

From Rangoon a railway runs up the Sittang valley and then across mountainous country to *Mandalay*, on the Irrawaddy, whence it is continued northward along a tributary valley. From Mandalay two motor roads, completed in 1938, link Upper Burma with the Plateau of Yunnan in China. One goes up the Irrawaddy valley, passing through Bhamo, near the frontier; the other strikes north-east, following the line of the railway to Lashio, beyond which it is continued across the Chinese frontier.

Thailand (Siam)

Thailand is an independent kingdom inhabited mainly by people of Mongolian stock most of whom are Buddhists. Though slightly smaller than its neighbour, Burma, it has approximately the same population. The country, which extends south into the Malay Peninsula, is intersected by innumerable waterways, of which the most important is the Menam, which in its lower course flows through a wide plain flanked by mountains.

No other land is more densely forested. But in the lowlands margining the rivers areas have been cleared and are now occupied by paddy fields, irrigated by numerous

canals; and by clusters of villages whose palm-thatched bamboo huts are built on piles so as to be above the reach of flood waters during the rainy season. *Bangkok*, the capital, chief port, and only large town, stands some miles up the Menam. In the flood season immense rafts of teak, and flat-bottomed rice boats with bulging sides, come floating down-stream to the timber yards and rice mills of the city. Many of the people of Bangkok, and its outport, Pakam, live in houseboats moored along the banks of the Menam river. And though Bangkok is connected by rail with various parts of the country, and also with Singapore, yet transport is mainly carried on by boat along the rivers, streams, and canals.

French Indo-China

This is the Age of Speed and it takes but six days to fly from Marseilles to *Hanoi*, the port-capital of French Indo-China. This territory, which is about one and a third times the size of France, comprises the colony of Cochin-China together with four protectorates.

Almost the whole of Cochin-China, with the adjacent area, consists of the huge delta of the Mekong. In no other part of the world have rivers exercised a greater influence on the life of Man. Not only have the great waterways themselves built up huge deltas and rich alluvial plains, but lesser streams descending to the coasts are continually depositing sediment at and about their mouths. There it is trapped by mangroves, which thus help in reclaiming the land. As the amount of silt increases and the sea recedes, the marshy ground is drained and planted, and before long is transformed into verdant rice fields. So rapid is the process of land formation that Hanoi, now some 60 miles up the Red River, actually stood on the sea in the seventh century A.D.

The Mekong, rising in Tibet, receives the drainage of Lake Tonlé Sap, which in the rainy season acts as a natural reservoir and so helps to reduce the damage from floods. Important fisheries are carried on in this lake as well

as in the rivers and coastal waters. Of the cultivated crops, rice is, of course, the chief, but others planted on cleared forest-lands comprise maize, rubber, cotton, sugar-cane, and mulberry-trees whose leaves are fed to silkworms. The minerals include coal, zinc, tin, and wolfram. Much rice, as well as dried and salt fish, is exported from *Saigon*, to the east of the Mekong delta.

Malaya

The greater part of the Malay Peninsula is under British control. The islands of Singapore and Penang and certain territories along the west coast form the Crown Colony of the Straits Settlements. The Federated Malay States and five other native states are under British protection. The total area of Malaya is approximately equal to that of Scotland, and its population ($3\frac{1}{2}$ millions) is about three-quarters as great.

In the Malay Peninsula lowlands of varying width border a granite backbone of fold mountains which rise to a height of about 8,000 feet. As the peninsula lies in the equatorial monsoon region temperatures are uniformly high and the seasons are distinguished by their rainfall. At Singapore, in the extreme south lying almost on the Equator, every month is wet, but farther north there is, as in India, a wet season from May to October, followed by a relatively dry season. Apart from areas cleared for cultivation, mining, or settlement, the whole region is thickly forested. But thanks to its insular position which to some extent modifies the climate, and, what is more important, makes it more accessible than most hot wet forest areas, Malaya is by far the most developed part of Indo-China. It grows more rubber than any other country and produces about one-third of the world's tin.

In Malaya most of the *rubber* plantations are situated on the sides of undulating hills where the deep soil is well drained to prevent the heavy rainfall from clogging the roots

of the trees. After the ground has been cleared by felling the trees and burning the stumps and the undergrowth, bungalows are erected for the European supervisors, huts are built in the native 'lines', and later a factory is constructed.

The trees are planted in rows, ample space being allowed for them to grow. On some estates the ground between the trees is sown with leguminous plants which enrich the soil. On plantations owned by Chinese, pine-apples are often grown as catch-crops so as to bring an immediate return to the owner before the rubber-trees begin to yield.

As a rule tapping does not commence until the fifth year, but the trees do not give their full yield until they are ten years old. The latex—the milky-white fluid obtained by tapping the trees—is treated at the plantation factory with acetic acid which causes it to form a junket-like mass of pure white rubber floating in a clear whey. This process is known as coagulation. The coagulated rubber is passed through the rolling machine and emerges as thin sheets which, after they have been smoke-dried, form the *smoked sheets* of commerce. Another process produces pale-yellow sheets, with a grained surface, which are known as *crêpe rubber*. The sheets are then sorted, graded, and packed in chests for dispatch to Singapore for export.

Though vast quantities of rice are grown on the lowlands the supply is insufficient for the demand and much is imported. The coconut palm is seen nearly everywhere throughout Malaya, and the Malay plants this useful tree wherever he settles. The chief plantations, however, are found on the coast-lands of the west, and most of the copra that is exported comes from this area. The bulk of the British supply of pine-apples is obtained from Malaya. Other crops include oil-palms, sugar, pepper, tapioca, nutmegs, and tobacco.

Tin, by far the most important mineral, comes mainly from the valleys in the west, where Kuala Lumpur and Ipoh are the chief sources. The ores, which lie under

alluvial deposits, are obtained by dredging. They are sent to be smelted at Singapore or Penang before being exported. Coal of a rather poor quality is mined, as well as some gold, copper, and iron-ore.

Singapore is the chief seaport and town in British Malaya. Standing on an island at the southern extremity of the Peninsula it is linked with the mainland by a causeway carrying a road and railway. The port is placed at the point

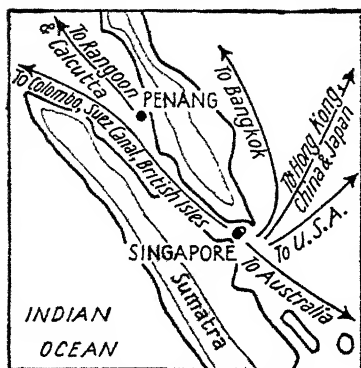
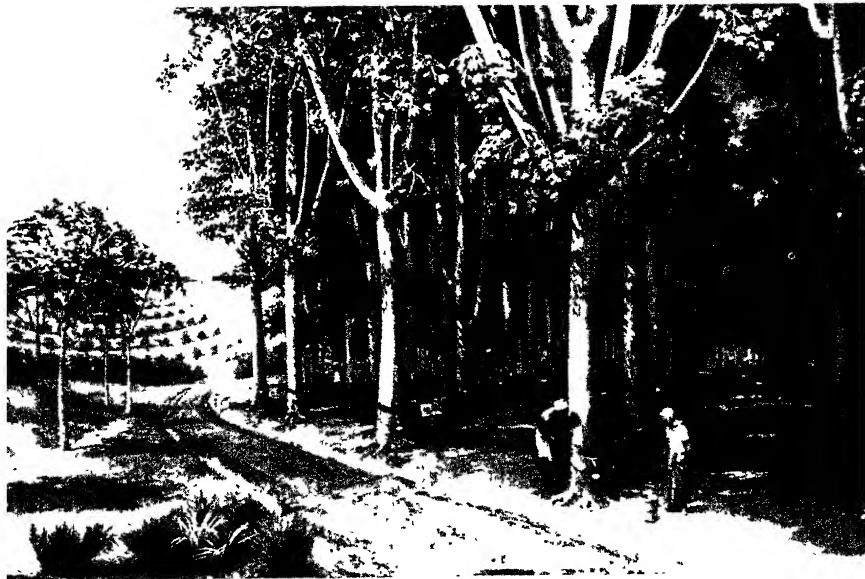
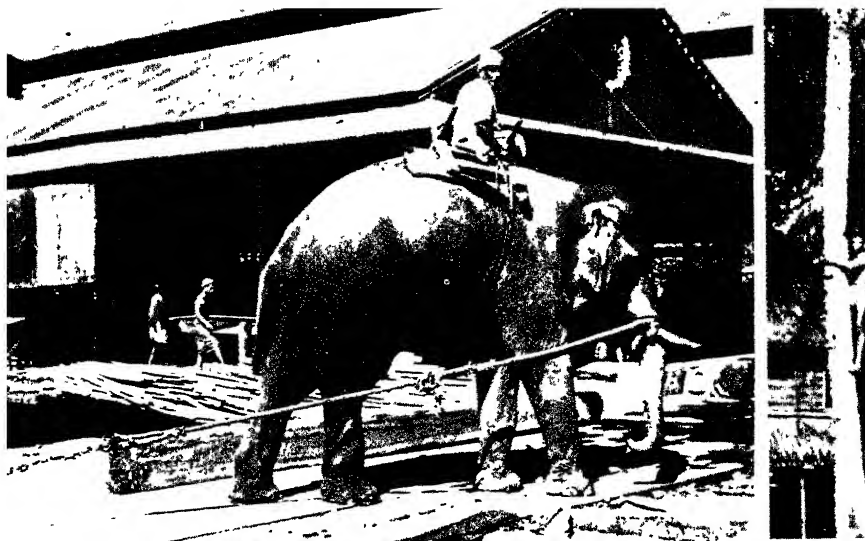


FIG. 33. Site of Singapore

where ocean routes from Europe via Suez, India, Ceylon, and Africa meet those from China, Japan, Australia, and the Pacific ports of America. Singapore is also an airport on the route from Europe to Australia, New Zealand, and China; a British naval and air base of great strategic importance, and a refuelling station for naval and commercial craft. Its magnificent harbour, sheltered from the prevailing winds, coupled with its central position, has made it one of the greatest entrepôt ports of South-East Asia, collecting rubber, tin, and copra from Malaya; sugar, spices, petroleum, and other products from the East Indies and re-exporting them to all parts of the world. Moreover, the port is well placed for obtaining coal from India, Australia, and Japan. The extensive fisheries carried on in surrounding seas are centred on Singapore, a collecting centre whence the fish are dispatched to the neighbouring islands in the East Indies.

Penang, the second port, on an island off the west coast, has a considerable export trade in tin. *Kuala Lumpur* is the capital of the Federated Malay States.

Their maritime situation, within easy reach of India and



5. TEAK AND RUBBER

(Above, left) An elephant hauling teak to a saw-mill in Burma (see p. 69). (Above, right) Tapping a coconut palm (Philippines) for sap, used to make a drink called tuba. (Below) A rubber plantation in Malaya. Note (i) that each tree is numbered to record the yield of sap, (ii) the method of tapping; (iii) the type of plantation labour, and (iv) the terraces in the background, where different crops are grown at varying elevations (see p. 72).



6. PADDY FIELDS IN CHINA—IRRIGATION AND CO-OPERATION

Rice is sown in nursery plots before being planted out. The embankments are essential as the rice requires frequent flooding until it begins to ripen. Co-operative effort is necessary to secure the correct flow of water for each plot. Note the farmstead (middle foreground), and the temple on the hill in the background. Owing to the reverence paid by the Chinese to the memory of their ancestors, temples, shrines, and graves occupy an enormous area (see p. 83).

China, accounts in large measure for the mixed population of Malaya and the East Indies.

The Malays themselves, who live both in Malaya and the adjacent archipelago, are mainly of Mongolian origin. A people of river and sea they prefer fishing, and cultivating their tiny plots, to regular employment on the plantations and in the mines, where much of the work is done by industrious Chinese. With their genius for business the Chinese are also the chief shopkeepers, traders, and merchants in Malaya. Many Chinese own or are employed on the plantations, though on those devoted to rubber production the majority of the coolies are Tamils from Southern India. Punjabis from North-West India serve as policemen and watchmen. To this human patchwork must be added Arab traders and Japanese fishermen. The Europeans, relatively small in number, are chiefly engaged in administrative work, in commerce, and in supervision in the plantations and mines. Without European organization it is doubtful if this region would have been developed, but it is equally true that without those immigrant peoples from more densely peopled areas, who supply the necessary labour, little progress could have been made. This co-operation between East and West has made Malaya and the Dutch East Indies one of the most productive tropical regions in the world.

EXERCISES

1. Give *three* reasons that help to explain the importance of Singapore. Illustrate your answer by a sketch-map.
2. (a) Malaya is one of the most productive tropical areas in the world. Give *three* reasons to account for this. (b) Name another British possession—outside Asia—lying in similar latitudes.
3. Name three important tropical products obtained from Indo-China. In the case of *one* of them describe how it is obtained and prepared for export.
4. Cochinchina has been described as 'the gift of the Mekong'. In what way is this statement true?

CHAPTER X THE EAST INDIES

The Islands and their Peoples

THE East Indies, which lie between the mainland of Asia and Australia, extend from west to east for more than 3,000 miles. The fold ranges, running through Sumatra, Java,

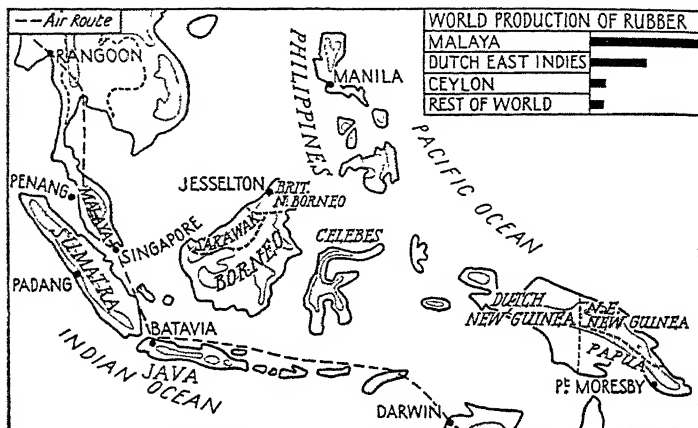


FIG. 34. British Malaya and the East Indies

and the Moluccas to the Philippines, contain along their weakened crests many active and extinct volcanoes. In 1883 two-thirds of the island of Krakatoa in the Sunda Strait, between Java and Sumatra, was blown away in an eruption. Thousands perished, and the fine volcanic ash thrown into the upper air currents continued to colour the sunsets with purple-red hues for nearly two years. In 1928 a lesser eruption took place when lava, boiling mud, and clouds of steam poured out of the giant crater.

The climate and products of the East Indies resemble those of Malaya. Temperatures are uniformly high. Rain falls throughout the year: it is heaviest and most continuous near the Equator, and islands farther away tend to have wet

and dry seasons. The vegetation is luxuriant. The soaring mountains, rising out of the tropical seas between the Indian and Pacific Oceans, are clothed with verdure to their very crests. In some districts coconuts spread along the shores; in others mangroves flourish in slimy ooze which at each high tide is covered by the sea. Beyond are lowlands planted with rice, behind which rise forests, except where the hill-sides have been terraced for cultivation, or where at higher elevations open woodlands occur.

The population, descended from successive waves of immigrant peoples, is of mixed origin. The Malays, who form the bulk of the inhabitants, settled in the lowlands, driving the more primitive folk they found there into the inaccessible forested interiors, where their descendants—some still head-hunters and tree-dwellers—are to be found to-day. Portuguese and Spanish conquerors were followed by the Dutch and British. In 1899 the United States took the Philippines from Spain, but that island-commonwealth has been promised complete independence in 1945 by the American government, not unwilling to free itself from its Asiatic possessions.

Java

Of all the islands *Java*, which is about four times the size of Holland, is by far the most developed. Together with the adjacent island of Madura it has 51 million inhabitants. Its remarkable prosperity is due to its rich volcanic soil, its climate, the absence of mangrove swamps, and the Dutch genius for organization. The original Malay stock was improved by intermingling with Hindu settlers, with the result that the modern Javanese are more industrious than the less mixed Malay type.

A remarkable system of agriculture is carried on. The hill-sides are terraced up to 5,000 feet, thus allowing the heavy rains to sink into the land instead of wearing it away and causing disastrous soil erosion. There are coconut and

cacao plantations along the coast, and though rice is cultivated everywhere in the lowlands, as well as on irrigated lands at higher elevations, much has to be imported. Rubber, with pine-apples planted between the young trees, is grown on the foot-hills, and sugar-cane, spices, tea, coffee, tobacco, and maize at succeeding elevations. Then come cinchona trees from whose bark quinine is obtained, and open grazing lands of the savanna type where humped cattle are bred. Outside the volcanic areas forests still abound, the most important tree being teak. *Batavia*, the port-capital, on the north-west of the island, has an important export trade, especially with Holland. The bi-weekly air service between Batavia and Amsterdam covers the 8,830 miles in eight days.

Coal and petroleum are found in *Java*, *Sumatra*, *British North Borneo*, of which Jesselton is the capital, and in *Dutch Borneo*. Some tin is mined in Java, and there are especially rich deposits in the islands of *Banka* and *Billiton*, off the east coast of *Sumatra*. The last-named island, the second largest in the archipelago, is only partly developed. Padang, the chief port, lies on the west coast, the progress of the eastern seaboard being hindered by the presence of mangrove swamps.

The Philippines

The United States has done much to develop the *Philippines*, which consist of some 7,000 islands and islets having a total area of 114,000 square miles. The chief islands are Luzon and Mindanao. The extensive forests yield ebony, dyewoods, gums, and cedars. Though many thousands of acres are planted with rice, much is also imported to supply the requirements of the 13 million inhabitants. The great heat and moisture, the sea breezes, and the sandy soil of the coast-lands, provide ideal conditions for growing *coconuts*, and these natural conditions, coupled with good transport facilities, have made the Philippines one of the leading

exporting areas in the world. The kernels are extracted from the coconuts, dried, and then taken to factories, where the dry mass, now known as copra, is broken up, ground, heated, and pressed to extract the oil. The coir, or husk, of the nuts, is soaked and beaten, either by hand or machinery, to separate the fibres, which are twisted into ropes or woven into matting. Other exports include Manila hemp and tobacco. *Manila*, the capital of the Philippine Commonwealth, situated on Luzon, has a splendid harbour which affords shipping protection from storms, called typhoons, that frequently rage in the surrounding seas. Flying-boats, on the Trans-Pacific air service, take seven days to cover the distance between Manila and San Francisco.

EXERCISES

1. Examine the photograph (Plate V) noting that it was taken in a Dutch island in the East Indies. Then answer the following questions.

(a) Name *one* reason why the lower slopes of the mountains are terraced. (b) The chief crops grown in the area are cinchona, coffee, rice, rubber, sugar-cane, and tea. Starting with that grown at the lowest elevation, arrange the others in order according to the altitude at which they are cultivated. (c) Name *three* of the above crops which you think are grown mainly for export. (d) Name *one* crop produced chiefly for home consumption. (e) In the case of *one* crop describe briefly the climatic and other conditions necessary for its successful cultivation. (f) Suggest, giving your reasons, the name of the island.

2. In each case give *four* reasons which help to account for the following: (a) the remarkable prosperity of Java; and (b) the fact that the Philippines are one of the leading coconut producing and exporting areas in the world.

CHAPTER XI

CHINA

The Awakening of China

FOR many centuries the Chinese have been a civilized people. By penetration and conquest they extended their frontiers until their Empire included the greater part of Eastern Asia. Some six centuries before the Romans came to Britain the Chinese built a great wall, 2,000 miles long, across their northern boundary to keep out the fierce Tartar horsemen of the Mongolian steppes. Within their vast territories they remained almost isolated until the middle of the last century. Then, partly as the result of a series of wars in which China was defeated by European powers, and later by Japan, the country was gradually opened up for trading purposes to the industrial nations of Western Europe, the United States, and Japan.

In 1912 a revolution took place and the Chinese Empire, one of the oldest Monarchies in the world, was overthrown, and a Republic set up. The Empire, with an area of $4\frac{1}{2}$ million square miles, included China Proper, which formed the nucleus of the Republic, Manchukuo (Manchuria), Mongolia, Tibet, and Chinese Turkestan. Of the outlying territories, Manchukuo and Outer Mongolia now claim to be independent states, while over the other regions the Republican government exercises no effective control. Indeed, owing to difficulties of communication, differences in languages and dialect, local jealousies, banditry and rebel armies, and lack of national spirit, the Central Government was not able to enforce its authority over China Proper until 1928. But its power was short-lived, for in 1937 the Japanese, who had already secured Manchuria and the adjacent Chinese provinces, invaded

China. They seized the main lines of communication, the chief seaports, many cities and strategic points, and by the end of 1938 had virtually cut off China's sea-communications with the outside world. Japan aims at obtaining effective control of China's vast resources and valuable markets.

For though the majority of the population depend on agriculture for their livelihood, yet one of the most striking features in the development of modern China has been the progress of industrialism.

The more we learn about the Chinese, the greater becomes our sympathy for them. They are an extraordinarily gifted and intelligent people, hardworking and patient, and in recent years had begun to organize themselves into a nation as we understand the term. But their progress was slow, especially in militarization, and they were ill prepared to withstand the powerful modern armaments of Japan. They are still (1941) maintaining their struggle for independence against great odds.

China Proper

China Proper is somewhat less than half the size of the former Empire, but within its borders live some 420 million people, or about a quarter of the human race. Outside the great alluvial plains drained by the Yangtze-kiang, the Hwang-ho, and the Si-kiang, the greater part of China is mountainous. On the west lofty ranges and plateaux hinder communication with Burma and Tibet, though in the north-west the natural boundaries between China Proper and Mongolia are not so well defined and communication is easier.

Most of China lies north of the Tropic of Cancer, whereas much of India lies to the south. This fact, coupled with the absence of a mountain barrier in the north, accounts in large measure for the cold winters experienced in Northern China. As the country has a monsoon climate, rain falls

mainly in summer, being heaviest in the south where no month is quite rainless.

The Land and the People

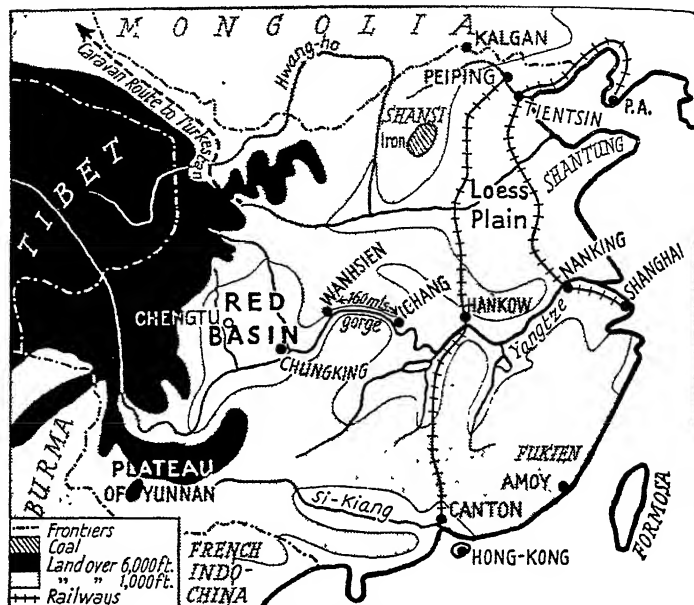


FIG. 35. China

Owing to the great amount of mountainous land all suitable ground is intensively cultivated and densely peopled by millions of workers. Many live in walled towns; others in villages, also walled, which usually have stone or mud watch towers, and one or more shallow embanked pools, which serve as places for drawing water, bathing, goose and duck ponds, and water-holes for animals. In the lowlands, where the natural vegetation has been almost entirely cleared for cultivation, little land is available for pasture. Hence there are few animals, apart from pigs, draught buffaloes, and, in

the north, horses, donkeys, and mules, which are used for transport; but cocks and hens, geese, and ducks abound.

Out of every 100 Chinese about 80 depend on the land for their livelihood. Yet despite the need for cultivating every available piece of land, so great is the reverence of the Chinese for the memories of their parents and ancestors that temples, shrines, and graves are seen everywhere, and the total amount of land devoted to this purpose is very great indeed (see Plate VI). Sometimes the graves stand singly in the fields, sometimes in twos or threes, and sometimes in groups; and many are crowned with a goblet or a bowl. Though we cannot but admire the piety of the Chinese, yet their excessive devotion to the departed is a hindrance to the development of the land.

Most of the farm-holdings are only two or three acres in extent, but on each is grown enough to support an entire family. Nearly all the work is done by the peasants themselves and little machinery is used. Wooden ploughs are drawn across the tiny banked-up fields by water buffaloes, and the farmer uses sets of iron blades of different shapes which he fastens to a bamboo pole according to whether he wishes to employ it as a spade, a rake, or a hoe. The land is irrigated by countless canals. Water is generally lifted by water-wheels driven by buffaloes or turned by treadmills worked by man-power. In mountainous districts water is sometimes raised from one canal to another to a height of several thousand feet. Silt from the rivers and canals, as well as all other suitable material, is used to fertilize the land from which the industrious Chinese wrest a livelihood.

Rice is the staple food crop in Central and Southern China, and millet and soya beans in the drier cooler north. Little meat is eaten, though pork may be provided on feast days, and the vegetable diet is chiefly supplemented by fish.

In recent years some 12,000 miles of paved highways suitable for motor traffic have been constructed, but most of the roads are mere tracks of beaten earth too narrow for

vehicular traffic. But footpaths run everywhere. In the north one-wheeled wagons and carts drawn by animals are used, but throughout most of the country land transport is dependent on pack-animals, man-power being cheap in this densely peopled land; and the coolies carry heavy loads on their backs, or in baskets slung from either end of a pole resting on their shoulders. They also move freight and passengers in wheel-barrows, covering hundreds of miles at a rate of about 30 miles a day. A great internal trade is carried on over the earthen roads and footpaths, and an even greater volume along rivers and canals, whose mileage exceeds that of any other country. Railways are few. In 1941 there were in the whole of China only 8,100 miles of track compared with 42,000 miles in India. Air transport is being developed.

Southern China

Southern China is an extremely mountainous region much of which is covered with forests that yield good hard timbers, camphor, wax, and innumerable bamboos. Tin and other minerals are mined in the Plateau of Yunnan. On the east the mountains are bordered by a sunken coast where the valleys have become flooded by the sea, forming inlets of the type known as *rias*. Many of the openings provide splendid harbours, like that on which stands *Amoy*, the chief port of Fukien, a famous tea-growing province. As much of the rugged interior is unsuited for cultivation many of the inhabitants of the coastal districts have turned to the sea for their livelihood. The number of junks, sampans, and other native craft is beyond count. Numbers of people are fishermen or sea-traders; others are pirates. Some have settled on islands in the Pacific or have migrated to the East Indies and Malaya.

The valley of the Si-kiang is the most fertile part of Southern China, and on the alluvial soils of the lowlands rice, sugar-cane, cotton, indigo, and oil-seeds are cultivated.

The hill-sides are planted with tea-shrubs and mulberry-trees. Sericulture, as the silkworm industry is called, is one in which much care and labour are required. The young silkworms need fresh leaves four or five times a day, and about 120 lb. of leaves are required to produce 1 lb. of silk. In China and Japan the picking of the leaves and the tending of the worms are often done by the women and children of the peasants' families, and as they receive no pay production costs are small.

Canton, the chief city and Chinese port of the south, stands at the head of navigation on a distributary of the Si-kiang. Near this point tributaries from the north and west provide additional waterways into the interior. Canton was built some distance up the Si-kiang so as to be less exposed to attacks from the pirates who haunted the coasts. Fortunately placed at the head of the delta, in the midst of a region of great fertility, the city collects the produce from the surrounding area, manufacturing tea, silk, and cotton. It is now connected by rail with Hankow and Peiping, and also with the British port of Kowloon, opposite Hong Kong. Like a number of other ports Canton consists of a modern quarter and a purely Chinese city. The fine streets and buildings of the former present a great contrast to the crowded thoroughfares of the latter, most of which are so narrow that wheeled traffic is impossible. Many of the Chinese have sought refuge from the congested conditions on land in sampans on the river, which often accommodate several families as well as miniature duck and poultry farms (see Plate VII). Some of these river-folk ply as boatmen; others fish. But they, or rather their wives, have no need to land to buy rice, vegetables, and other necessities, for trading boats make their daily rounds, each one displaying from its mast-head a sample of its wares. Before the outbreak of the second Great War in 1939 much of the foreign trade of Canton passed to Hong Kong, owing to its greater security under British protection.

Hong Kong

The island of Hong Kong lies off the Si-kiang estuary, but the territory of this British Crown Colony includes the peninsula of Kowloon on the mainland opposite. The island is of great strategic and commercial importance. The city of Hong Kong (Victoria), which stands on a splendid harbour, is a British naval base. In order to store water for use in an emergency, such as siege, a huge

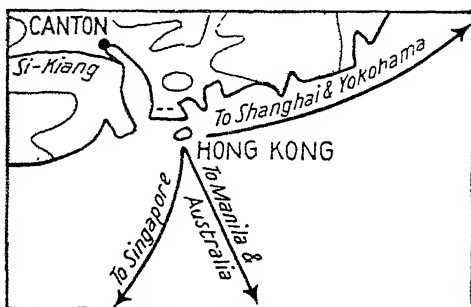


FIG. 36. Site of Hong Kong

reservoir, covering nearly 2 square miles, has been made by building a massive dam across a valley so as to conserve the monsoon rains. Hong Kong is the chief entrepôt port of Southern China, and a distributing centre for islands in the Western Pacific. Its imports include flour, coal, and rice, which is re-exported to China where even the enormous quantity grown is insufficient for the needs of the dense population. The main exports, including re-exports from China, are silk, tea, and cotton. Besides shipyards, it has rope and tobacco factories; while tin from Yunnan is smelted in its refineries, and cement manufactured. Hong Kong is also a centre of deep-sea and coastal fisheries. Its trade has suffered as a result of the Sino-Japanese conflict and the second World War.

Central China and the Yangtze-kiang Basin

The basin of the Yangtze-kiang forms Central China, a region comprising about one-third of the country and containing more than a third of the population. Together with its tributaries, and a remarkable network of canals used for irrigation, transport, and drainage, the Yangtze is the main highway and source of life for the whole of this vast area; by water all trade is carried on, whether by the old duck farmer in his little sampan, conveying his flock to market, or a large Blue Funnel steamer loading beans or bales of tea at Hankow. From its source in the Kunlun Mountains to its mouths in the East China Sea, the Yangtze measures over 3,000 miles. Apart from small native craft, the upper course of the Yangtze is of little use for transport, but its middle and lower courses are navigable.

In China Proper the Yangtze may be divided into four sections: the Red Basin of Szechwan; the Ichang Gorges; the Middle Basin; and the Lower Basin and Delta.

The Red Basin, whose area is rather more than half the size of the British Isles, takes its name from the prevailing Red Sandstone which weathers to form a soil of extraordinary fertility. The summers are hot, but owing to the encircling mountains the winters are milder than in most parts of Central China, and frosts and snows are rare. Snow-fed streams, such as the Min-ho which rises in the mountains of Tibet, are used to irrigate the land. Thanks to the favourable conditions of climate, soil, and water-supply, the basin is intensively cultivated and is one of the most densely peopled parts of China. Usually three or four crops a year are raised, including rice, maize, wheat, tea, and tobacco. Countless mulberry-trees support a large silk industry. Coal, iron, and copper are mined. Of many walled cities and towns scattered over the plain, the chief are *Chengtu*, on the Min-ho, the capital of Szechwan, and *Chungking*, at the confluence of the Yangtze and the Kialing,

the chief river port, and National capital of China during the Sino-Japanese War.

The Yangtze is bordered by hilly country from Chungking to Wanh sien, at the entrance to the Ichang Gorges.

The Ichang Gorges, except where the mountains recede from the Yangtze-kiang, extend from Wanh sien as far as Ichang, a distance of 160 miles. Huge cliffs rise almost vertically a thousand feet or more on either side, and below are rushing, swirling waters that seem to express the river's indignation at being pent in by the sheer walls of rock. The atmosphere of gloom is only dispersed when the rays from the almost overhead sun shine down into the gorge about the middle of the day.

Though small steamers can make the course during the late spring and summer it is impossible for them to do so at other seasons, and at the beginning of the spring floods the gorge is quite impassable. At this time the water sometimes rises as much as 50 feet in twenty-four hours; and the difference in the level between summer and winter is about 100 feet. At low water the stream rushes over rapids, which are caused either by the different levels of partly exposed rocks in the river-bed, or by the presence of boulders and rubble carried into the main stream by swiftly flowing mountain tributaries.

Native junks are towed up-stream through the rapids by bands of sweating coolies who walk along the bank bent double under the strain; as many as 200 may often be seen pulling an average-sized junk against the current. Down-stream craft come shooting through the eddying waters, almost, and often entirely, out of control.

The Middle Basin. From Ichang to Hankow, a distance of about 300 miles, the Yangtze flows through its Middle Basin where it receives a number of important tributaries, including the Han from the north-west, and from the south-west the Siang-kiang which carries the drainage of lake Tungting. In spring when the waters begin to rise the

lumbermen float down the latter river huge timber rafts which they have built during the winter. These rafts are usually about 200 feet long and 40 feet wide, and on the bigger ones live four or five families, men, women, and children, with their chickens, goats, and pigs. The rafts are made in sections, and as they float down-stream portions are sold at the towns *en route* until, at last, there is nothing left. Then the men and their families return by junk to the forests to fell timber for the succeeding year.



FIG. 37. Comparative Output of Pigs from leading countries
1. China; 2. U.S.A.; 3. Germany; 4. U.S.S.R.; 5. Poland

Throughout its Middle and Lower Basins the Yangtze flows through flat country, broken only by gentle slopes; and in but a few places is the river bordered by low hills. Fields of rice and cotton, plantations of mulberry-trees and tea, spread as far as the eye can see, and the whole countryside looks rather like one vast allotment, crossed by countless canals and dotted with clusters of huts built of reeds and daubed with mud. While an enormous number of people live on the land, many families make their homes in sampans on the rivers.

Along the banks of rivers or canals lie the small embanked paddy fields, on which many people depend for their living (see Plate VI). The rice seedlings are sown in a tiny plot in a corner of the field, and while they are growing the land is flooded, and wooden ploughs drawn by water buffaloes are driven across it to mix mud and manure together until they are about as thick as stiff porridge. When the seedlings are ready they are planted out in rows, three or four plants being pressed firmly into each hole. The field has to be weeded frequently: every time this is done the water must be allowed to run off, and then the ground must be flooded

again by lifting water from river or canal, a process usually carried out by means of water-wheels, sometimes driven by buffaloes but more often turned by a treadmill at which men, women, and children all work hard. When at last the

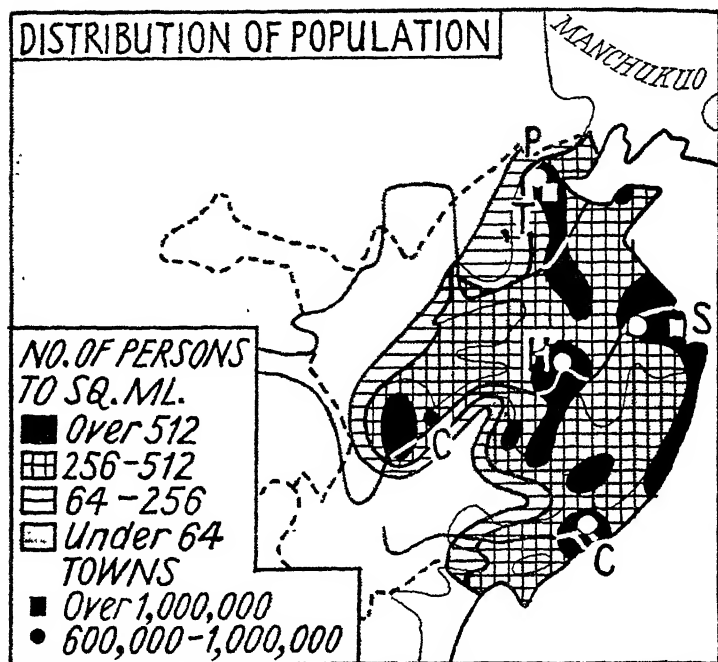


FIG. 38.

leaves begin to turn from green to yellow the water is finally drained off to allow the rice to ripen in the sunshine. After the crop has been cut with sickles it is tied up in bundles, dried, and taken to the threshing floors. Here the grain is either trodden out by oxen or buffaloes, or beaten with flails, after which it is winnowed by throwing it into the air.

The Lower Basin. The Yangtze enters its Lower Basin at its confluence with the Han where stands the triple city of *Hankow-Hanyang-Wuchang*. Though Hankow is 600 miles

from the sea, it is a port for ocean-going steamers. Standing on the north-to-south railway from Peiping to Canton, it is a great tea market, and has cotton, hemp, and flour mills. Hanyang, on the opposite bank of the Han River, is noted for its iron and steel works and arsenal, which are fed with coal and iron from the Hunan field to the south. *Nanking*, former capital of China, stands farther down stream. Nearly six centuries ago an emperor enclosed great tracts of farmland within its battlemented walls to enable it to withstand a siege. In part, despite recent warfare, these walls still stand enclosing the congested city, surrounded by primitive villages, set amidst rice fields, pools, graves, groves, and ruined temples. In Nanking itself cotton, silk, and paper mills, and other modern buildings, some in Western and some in Chinese style, stand side by side with miserable hovels and attractive houses some of which are centuries old. On the great new road driven through the town stand the Government buildings, and not far away are the two universities.

Shanghai, the outlet for the Yangtze valley, is situated on the Whangpoo River, on which stands its outpost of Wusung, at the point where the Whangpoo enters the Yangtze estuary. Shanghai consists of a crowded Chinese city, an International Settlement, and a French Concession, and its population, including its sprawling residential and industrial suburbs, exceeds $3\frac{1}{2}$ millions. Its manufactures include silk, woollen, and cotton goods. It is the greatest port and normally the busiest commercial city in Asia, but its trade has suffered as a result of the Japanese invasion of China and the second Great War (1939-). It is the chief entrepôt port in the country, collecting and exporting tea, silk, cotton, and a variety of animal products which include egg yolks, frozen ducks, and pigs' bristles. It handles half of China's overseas trade, much of which is carried on by British, American, and Japanese firms. The bulk of it is conducted with Japan, the United States, and Great Britain. Owing

partly to the low standard of living, and partly to her own great and varied resources, China requires little from the outside world. The foreign trade per head is small, though owing to the enormous population the total amount is considerable.

Northern China

Northern China consists of the basin of the Middle and Lower Hwang-ho, the lesser area to the north which is drained by the Pei Ho, and the Shantung Peninsula to the north-east. Much of this region is covered with *loess*, a light-yellow soil composed of sand brought by the high north winds from Mongolia. Though porous, the loess is extremely fertile and only needs water to make it bear wonderful crops. Owing to the softness of the soil the traffic on the earthen roads has carved out deep valleys.

So great an amount of sandy yellow sediment is carried by the Hwang-ho¹ that its very name is derived from the yellow colour of its muddy waters, as, too, is that of the Yellow Sea into which it pours its silt-laden load. In its lower course the Hwang-ho flows slowly over the plain. Unable to carry all its sediment, it deposits much upon its bed, so raising it. To protect the land embankments have been built, and the river actually flows on rather than through the plain, at a higher level than the surrounding land. Sometimes during floods the waters rise so high that they burst the embankments and sweep over the land, covering thousands of square miles, and causing enormous loss to life and property.

Owing to the slowness of its current, the river winds round obstacles instead of cutting through them and so forms great curves and bends. The current eats into the concave bank and forms a bluff. Along the opposite bank of the stream the current is much slower, and therefore the sediment drops, thus building up the land. In this way the river becomes more and more winding, in the course of time

¹ Hwang-ho = Yellow River.

the bends approach each other, and during floods the waters sweep across the lands between the bends, carving a fresh channel, and so shortening the river's course. After the waters subside the river may return to its original bed, but sometimes it follows the new channels and finds fresh outlets to the sea. During the last 2,500 years the Hwang-ho has changed its course at least eleven times. It now flows into the sea to the north of the Shantung Peninsula, but in 1851 its mouth was to the south.



FIG. 39. Comparative Populations of some of the most densely peopled countries. 1. China; 2. India; 3. Russia; 4. U.S.A.; 5. Germany; 6. British Isles; 7. France

In Northern China the summers are hot, but the rainfall is less than in the south, and in those years when it is inadequate droughts and famines occur. During the cold dry winters piercing dust-laden monsoons blow almost continuously. The sterner climate has helped to make the northern Chinese a hardier folk than those of the south. But the people are incredibly poor. This fact is brought home to us when we see them, after one of the raging sandstorms, armed with huge baskets and implements, rather like a cross between a fan and a rake, collecting every leaf and twig to use for kindling. At such times the whole country-side looks as if it had been swept, so carefully has all material fit for fuel been garnered.

Rice can be grown on the lowlands as far north as the Pei Ho, but the chief crops are those of a hardier variety such as millet—the staple food in the north—wheat, barley, and

soya beans. Cotton is grown in the Shantung Peninsula, but it is so short in staple that it can only be used for making coarse fabrics.

In the Shansi Highlands, which mark the western edge of the Northern Plain, are vast deposits of coal and iron. As yet they have been, for the most part, worked by primitive methods, as, too, has most of the coal in the Shantung Peninsula, and the iron in Chahar (Inner Mongolia). But the deposits are thought to be some of the most valuable in the world, and they account in some measure for the desire of Japan to obtain control of China.

Peiping, until 1928 the capital of China, is situated on the northern margin of the plain, at the junction of a number of routes some of which are now followed by railways. Lines run (1) north-east to Moukden, in Manchukuo; (2) south to Tientsin and Nanking; (3) south via Hankow to Canton; and (4) north-west to Kaglan, whence motor, camel, and coolie transport cross Mongolia, by way of Urga, to Irkutsk, in Siberia. The chief port of Northern China is *Tientsin*, a huge city with over 1¼ million inhabitants, standing on the Pei Ho, at the northern end of the Grand Canal which runs south for 800 miles to Hanchow, a little south of the Yangtze. At one time an important waterway, the canal is in part in disrepair and is little used for navigation. Tientsin manufactures cotton, and with its outport of Ta-ku, exports furs, soya beans, skins, and rice.

Manchukuo (Manchuria)

Following a series of military operations in 1931 and the early part of 1932, the Japanese obtained control of the Chinese territory of Manchuria. Together with adjacent provinces, they established it as a nominally independent state, called Manchukuo, with its capital at *Hsinking*. The area of this state is about three times that of Japan Proper. It has a population of some 35 millions, the bulk of whom are Chinese, though numbers of Koreans have settled in

the fertile valleys of the south-west, adjacent to their own country.

Manchukuo may be compared to a lipped bowl, of which the narrow lip reaches the sea in the south at the port of Newchwang. The centre of the bowl is formed by the Plain

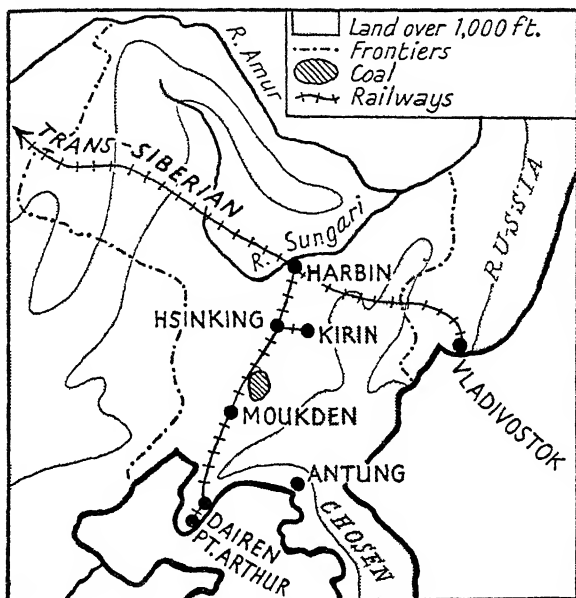


FIG. 40. Manchukuo

of Manchukuo, and the rim by encircling mountains of which the most important is the Khinghan Range in the west. Like Northern China the country has hot and moderately rainy summers, with very cold dry winters. In summer such roads as there are are often impassable owing to the mud. In winter, when the Sungari and other rivers are frozen for about five months, transport is easy both over the hard ground and the waterways where the ice is thick enough to support heavy motor traffic.

During winter lumbering and trapping are carried on in

the forested mountain areas. After the spring thaw great timber rafts may be seen floating down the Sungari to the saw mills at Harbin, and down the Yalu to those at Antung at the mouth of this river. In spring, too, the trappers take their pelts to Moukden, a fur-curing centre and market.

The Plain of Manchukuo, which nowhere exceeds 1,000 feet in height, is a steppe country. Millet—characteristic of the drier parts of the Monsoon Lands—is one of the chief crops. Not only does it provide food for men and animals, but its stems furnish materials for fuel, fencing, thatching, and mat-making, and its roots are used for kindling. Southern Manchuria is one of the leading regions in the world for the cultivation of the *soya bean*, whose commercial value has only recently been recognized, though for centuries it has been cultivated by the Chinese for food and oil. After the harvest beans are sent to the mills at Moukden and Dairen, whence they are exported in bags or in the form of flat round cakes.

With a view to developing its resources, which include valuable deposits of coal and iron, the Japanese have extended the railway net to all parts of Manchukuo, thus linking them with the ports and the systems of Korea and Northern China. The chief outlets of Manchukuo are *Port Arthur* and *Dairen*, in the south of the Liaotung Peninsula; *Newchwang*, and the ice-free ports of *Rashin* and *Seishin*, on the east coast of Korea. As all these are under their control, the Japanese are able to monopolize the trade of Manchukuo to the exclusion of other nations. From Port Arthur the South Manchurian Railway goes through Moukden to Harbin. The last-named is a junction for the Chinese Eastern Railway which runs from Vladivostok, through the Khingan Range, to Chita (Siberia).



7. CHINA: CANTON AND THE GREAT WALL

(Above) Canton (see p. 85). The factory chimneys in the background tell of modern industry; the steamers and junks that the Pearl River is navigable for ocean-going craft; and the sampans remind us that the river is the only home for a large proportion of the population. (Below) The Great Wall of China, 1,500 miles long, built about B.C. 600, across Northern China, for protection against Tartar horsemen of the Mongolian steppes (see p. 80).



8. JAPAN

Though Japan is an industrial country, scenes such as these remind us that only 16 per cent. is suitable for cultivation. (Above) Shooting the rapids. Streams though of little use for navigation are harnessed for electric power. (Below) Mount Fuji, most famous of the many volcanoes in Japan.

EXERCISES

1. (a) Draw a sketch-map of the Yangtze-kiang Basin. On your map shade the high land so as to bring out clearly the four regions into which the basin may be divided. Mark and name three important tributaries and five of the chief towns. Print on one area noted for the production of each the names of the following products: rice, millet, tea, and iron-ore. (b) Describe the main uses of the river and its tributaries for (i) irrigation, and (ii) transport.

2. In what ways are (a) the climate, (b) the products, and (c) the characteristics of the people of Northern China different from those of Southern China?

3. How do you account for the fact that the Hwang-ho is constantly changing its course? Illustrate your answer by diagrams.

4. What do you understand by an entrepôt port? Choose one port off the mainland of China, and one in China itself, and give some account of their entrepôt trade.

5. Name two important crops grown in Manchukuo. Describe the conditions for their large-scale cultivation, and name the chief purposes for which they are used.

6. Describe and account for the distribution of population in China.

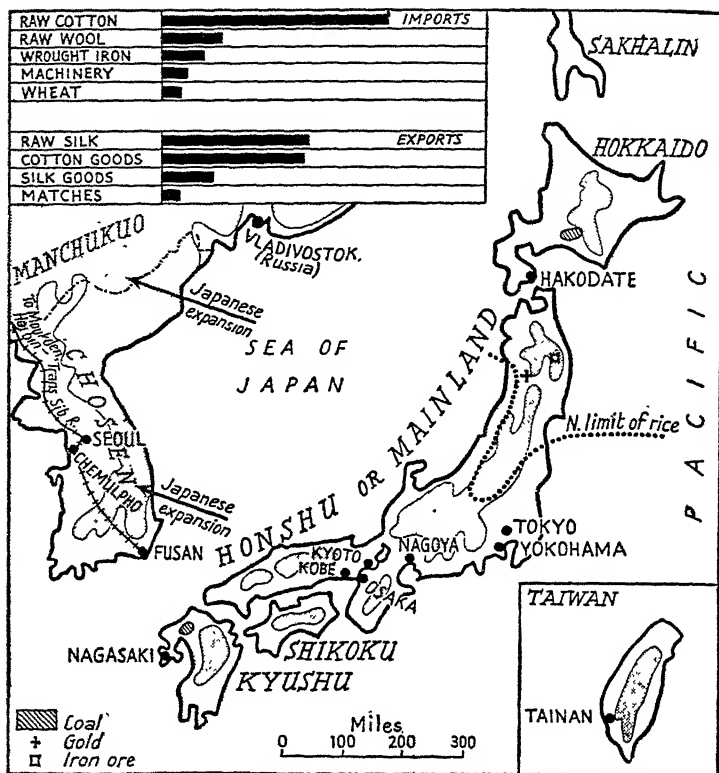


FIG. 41. Japan

CHAPTER XII

JAPAN

At first sight it seems remarkable that Japan, which three-quarters of a century ago was an almost unknown feudal state, should have become within a comparatively short time the most powerful independent country in Asia. History affords no precedent for it; geography no parallel to it. The rise of this island-empire dates from 1854 when the United States exerted pressure on Japan to open her ports to foreign trade. Soon the Japanese began to adopt Western ideas. The old feudal system was abolished. Advances in the scientific and industrial fields were accompanied by military, naval, and maritime expansion which resulted in territorial gains at the expense of China and Russia. From the former country Japan obtained Taiwan (Formosa) and Chosen (Korea); from the latter Kwantung, which forms the extreme south of the Liaotung Peninsula. After the War of 1914-18 Japan was given a mandate by the League of Nations over certain Pacific islands that formerly belonged to Germany. In 1932, she obtained control of Manchuria; in 1937 she began to overrun China in pursuance of her aim of acquiring effective control of that country.

Of the islands of Japan Proper the chief are *Hokkaido*, the most northerly, a little smaller than Ireland; *Honshu* or *Mainland*, the principal island, roughly equal in area to Great Britain; *Shikoku*, margining the Inland Sea on the south, about as large as Wales; and *Kyushu*, somewhat more than half the size of Scotland. In addition to these and countless smaller islands, the Empire includes the southern part of the island of Sakhalin, called *Karafuto*; the peninsula of *Chosen* (Korea); the *Kwantung* Peninsula; *Taiwan* (Formosa); and the *Marianne*, *Caroline*, and *Marshall Islands* in the Pacific. The total area of the Empire is 260,000 square miles, or somewhat more than twice the

size of the British Isles; while its population is rapidly approaching 100 millions.

Relief and Environment

The Japanese archipelago consists of a long string of islands, off the east coast of Asia, which are the unsubmerged portions of fold mountains. Owing to the nature of their formation all the islands have mountainous interiors, surrounded by isolated lowlands usually crossed by short swift streams, of little use for navigation, but often harnessed for hydro-electric power. The many excellent harbours along the coasts, opening to seas that abound in edible fish, have helped to make the Japanese a seafaring race, and their maritime environment stimulated them to build a powerful navy, a mercantile marine, and a fishing fleet that gives employment to over a million men.

As in other unstable regions of fold formation, such as the Rockies, Japan is subject to volcanic activity and earthquakes. Of the many volcanoes some fifty are still active. There are also numerous hot springs (compare New Zealand). On an average two or three earthquakes occur every day. Most of them are too slight to be noticeable, but others are disastrous, inflicting terrible loss of life and tremendous damage. In 1860 about 2 million people lost their lives in an earthquake at Tokyo. In 1923 much of the same city and the whole of Yokohama were destroyed by an earthquake and the fire that followed. People get warning of a quake from the behaviour of the animals, which become uneasy a few moments beforehand: dogs howl, ducks quack, and fowls squawk excitedly. To enable them to withstand the shocks the majority of the Japanese houses are built of light wood with interior walls consisting of paper screens. Such houses do not collapse unless the earthquake is severe, and the tiles and shingles are so arranged that they slide off and lighten the roof. But though a house may not fall and crush its occupants, yet

if the shock is sufficient to overturn a lamp, or fuse an electric cable, a raging fire, which spreads very rapidly, may result. Many modern structures, such as factories and blocks of offices, are now built of reinforced concrete which gives practical immunity from earthquakes. For example, the amplitude of the 1923 earthquake was about $4\frac{1}{2}$ inches, but it is estimated that the new British Embassy at Tokyo will stand a shock with an amplitude of over 2 feet. Moreover, concrete buildings, in which little wood is used, have the added advantage of being almost fire-proof. In 1923 the number of people who lost their lives as a direct effect of the earthquake was very small compared with the number burnt to death in the resultant fires.

Climate

Most of Japan has a temperate monsoon climate, modified by (*a*) its insular position which makes it less extreme than the corresponding areas in China; (*b*) the presence of ocean currents; (*c*) the mountainous backbone of the islands which, by reducing temperatures in the interior, and acting as a barrier to the prevailing winds, causes differences in rainfall between east and west; and (*d*) the great length of the archipelago, which extends for 2,800 miles from north to south.

The summer temperatures range from warm in the north to hot in Taiwan which extends into the tropics, while the greater part of the country is considerably hotter than the British Isles are at this season. Compare London 64° F. in July with Tokyo, 75° F. In summer the south-east monsoon winds, flowing in from the Pacific, bring rain to most of Japan, but especially to the south and east. Most rain falls during the latter part of June and early July when it is especially beneficial to the newly planted rice.

In winter north-west winds, blowing from the mainland of Asia, reduce the temperature. This is especially the case in the north-west, where Sakhalin and Hokkaido, lying

relatively close to the mainland, are exposed to icy blasts from Siberia, and are extremely cold, being often covered with deep snow. The north-west winter monsoons bring rain to the west, especially to the west of Honshu which they reach after crossing the Sea of Japan. But the east coast-lands are relatively dry in winter, for at this season (*a*) they lie on the leeward side of the mountains; (*b*) the winds which reach them have already parted with much of their moisture; and (*c*) they blow off-shore.

The warm Kuro Siwo current, which flows along the south-east coasts of Japan, by warming the winds that pass over it tends to raise temperatures along the south-east lowlands. On the other hand, the cold Kurile current, flowing along the east coast as far as Yokohama, reduces the temperature of north-eastern Japan at all seasons. In the area where the two currents meet frequent fogs occur owing to the mingling of warm and cold air.

Seasonal changes are accompanied by violent typhoons (see p. 79) which are not only dangerous to shipping, but often cause terrific floods that result in great loss of life and the destruction of property. The close of the summer monsoon is marked by torrential rains. Between spring and summer there is also a rainy period, lasting about three weeks, when damp penetrates everywhere and mildew appears on anything left untouched for a day or so.

Land Utilization

The way in which climate controls natural vegetation and agriculture is well seen in Japan. The ample rainfall favours the growth of trees. Some 60 per cent. of the country is covered with forests, and partly because of this, but even more on account of the mountainous terrain, only 16 acres out of every 100 are suitable for cultivation and settlement.

Deciduous forests of poplars and aspens, with conifers at higher elevations, are found in the north. The cherry is one

of the most familiar sights in Japan, but the trees do not bear edible fruits and are grown for their blooms. In the south are sub-tropical forests with bamboos, camphor, and lacquer trees, which yield a varnish used for coating trays and other articles. There are many varieties of bamboo. Taiwan is noted for its luxuriant bamboo forests, but hardier types are common in the south of Japan Proper where, in winter, they present a charming picture when bent low under masses of gleaming snow. Where in the British Isles we should find coarse grass covering the higher uplands, in Japan similar areas are clad with *sasu*, or bamboo grass. Bamboos serve many purposes. They furnish poles which are slung across the shoulders for carrying loads, canes used for punting boats, making waterpipes, doors, fences, ladders, chopsticks, and cages, and material for building light bridges; the young shoots are boiled and eaten.

About three-quarters of the farm lands are devoted to food crops. Rice is extensively grown in the south. Planted in June, it is harvested in September before the coming of the heavy rains marking the end of the summer monsoon. Wheat and barley, sown in autumn often on the same land as rice, are ready for cutting in May, after which the fields are again flooded for rice. Millet, soya beans, and potatoes are widely cultivated. Over a million acres are devoted to mulberry-trees, frequently planted on the banks between the paddy fields. The leaves are fed to silkworms, and, as in China, the cheap unpaid labour necessary for the industry is provided by the peasants' families. The hill-sides are terraced for tea plantations. Some of the finest tea is grown round Kyoto. Tea-drinking is a national institution and even the smallest village has its *charga*, or tea-house.

With a population of 70 millions in Japan Proper, and with so small a proportion of productive land, every available foot is intensively cultivated. Three-fifths of the arable land is worked by peasant proprietors, the rest by tenant farmers. Few farms exceed 3 acres in area, but their pro-

duce has to support on the average a family of six or seven persons. The land is tilled with great care, and by dint of hard work, the use of all kinds of fertilizers, irrigation, and terracing, the farmers are able to raise large crops, even though their tools are primitive. Flails are used for threshing, wooden ploughs to turn the ground. Wheelbarrows are unknown; earth is carried in a kind of straw hammock slung on a bamboo pole between two men's shoulders. Owing to the necessity for utilizing the land for agriculture, and to the unsuitability of native grasses, few animals are reared—sheep never, goats and cows rarely. In Japan beef is a luxury; milk is regarded as a kind of medicine.

The poorer peasants, who cannot afford even rice, live mainly on millet, barley, and fish, which abound in river and sea. The coastal waters are rich in cod, herring, mackerel, and salmon, many of which are canned for export.

Minerals and Manufactures

Japan's mineral resources are quite insufficient for the needs of her industries, a fact which helps to explain her desire to acquire deposits overseas. Copper, gold, zinc, silver, and coal are mined. The principal coal-fields lie in the south of Hokkaido, near the port of Hakodate, and in north-west Kyushu, near Nagasaki, the chief port of export. Japanese coal is not of a very high grade: much is imported from Chinese mines under Japanese control. Little iron is mined, and the bulk is obtained from Chosen, Manchukuo, and Northern China. Hydro-electric power is being rapidly developed.

Though most of the people depend on agriculture for their livelihood, yet during the present century industry has made such rapid progress that Japan now ranks among the leading manufacturing countries of the world. Home industries are still important, but the bulk of the goods are produced in factories equipped with modern machinery.

In all the large towns we see tall chimneys belching forth clouds of black smoke, and hear the sound of factory hooters. Coal and abundant water-power, ample and cheap labour, and efficient methods, account for the great strides Japan has made in industry and commerce.

The leading industrial region in the country is in the south of Honshu. Chief among Japanese manufactures are silk and cotton goods. Much of the raw cotton is obtained from the United States, China, and India. The bulk of the cotton goods, Japan's chief export, are shipped to India, the East Indies, and Thailand where they prove rivals to higher-grade products from Lancashire. Raw silk ranks next to cotton goods in the export list. The cocoons produced in cottage homes are spun in filatures (factories) where the work is done by women and girls. There are also many artificial-silk factories. Other important industries include the making of wrought-iron goods and machinery, ships, and aeroplanes; as well as older manufactures, such as the production of porcelain and pottery, with local kaolin; glass, lacquer goods, and toys. Many of these goods are of small worth in themselves, but owing to the enormous number turned out their total value is very high.

By developing her manufactures Japan has been able to provide employment for many people, and to extend her export trade, thus obtaining the money to purchase goods she needs from overseas. As the population is increasing at the rate of 900,000 a year Japan has to import an ever-increasing quantity of foodstuffs and raw materials for manufacturers. She must also find fresh markets for her products. It would be unjust not to recognize these facts, for they account in large measure for the desire to obtain overseas territories. Thus, for instance, Japan has sought an outlet in China where her interests are enormous. She is better placed for trade with her densely peopled but weak neighbour than any of her commercial rivals—the United States, Germany, and Britain.

Towns and Transport

Most of the people live in small villages along, or near, the coast, where in many areas there are about 2,500 persons to the square mile. The large cities are mainly situated in the manufacturing region in the south of Honshu.

Tokyo, the capital, stands on the southern edge of the largest plain in Japan, at the head of a bay whose upper reaches are, however, too shallow for modern vessels. A city of 6 million inhabitants, it is the world's third largest town, and one of the leading industrial and commercial centres in Japan. *Yokohama*, 19 miles distant, nearer the mouth of the bay, was rebuilt after the 1923 earthquake, and is now a modern port protected by extensive breakwaters and equipped with the latest devices for handling cargoes. It has steamer connexions with San Francisco and Seattle; with Vancouver; with New York via Honolulu and the Panama Canal; with Shanghai, Hong Kong, Singapore, Colombo, and Indian ports; and with those in the British Isles and Europe.

Nagoya (1,000,000) is an important port and railway junction on the line from Tokyo to Kyoto. The centre of a silk-producing area, it also manufactures cotton goods, glass, pottery; and its imports include raw cotton, rice, coal, and sugar. *Osaka*, the chief cotton-manufacturing centre in Japan, has 3 million inhabitants. Many of its factories are supplied with electricity from the power plant on the Kiso river. Its neighbour *Kobe* (900,000), the chief port on the Inland Sea and the second in Japan, manufactures cotton goods. It is a two hours' railway journey from Kobe to *Kyoto* (1,000,000), the old capital of Japan, situated some 10 miles from Lake Biwa. The city is an important tea market and a centre for the manufacture of silk, pottery, porcelain, and lacquer goods. But its chief interest lies in its palaces, its temples, half-hidden by the pine groves that spread to a background of encircling hills, and its native life, all of which combine to make Kyoto one of the most fascinating as well as one of the most historic cities in the country.

Hakodate, chief city and port of Hokkaido, exports coal, fish, and agricultural produce. *Nagasaki*, in Kyushu, which uses local coal in its steel works and shipyards, is the chief naval base in Japan. *Shimonoseki* (Kyushu) is a packet station for *Fusan*, in Chosen.

The railway system of Japan, including long electrified sections, is relatively extensive, and new lines are continually being constructed, often through difficult mountainous districts. Though the country has thousands of miles of roads the majority are poor, many being little more than cart tracks. Except in the towns, and in the vicinity of Tokyo, there are few highways suitable for motor traffic, and only the most intrepid motorist would venture to drive from Tokyo to Osaka. Rickshaws are still used by tourists and people whose business takes them into the maze of narrow lanes between the main streets of the towns which are far too narrow for ordinary vehicular traffic. But these picturesque two-wheeled carriages, whose name means man-strength-wheel, are rapidly being replaced by taxis, which are used in all the cities. As the majority of the large towns and most of the villages lie along the seaboard, a considerable coastal trade is carried on by steamers and junks, with big patched sails, curved keels, and high prows that lift easily over the waves.

Chosen (Korea)

Chosen, which is about the same size as Great Britain, has a population of some 22 millions. This mountainous forested peninsula rises steeply from the Sea of Japan, but is margined by lowlands towards the Yellow Sea. The climate is more extreme than that of Japanese islands: the winters are dry and cold, but heavy rains fall during the summer monsoon. Hardy cereals, such as barley, are grown in the north; millet, rice, beans, and tobacco in the south. The gold and iron mines furnish Japan with useful supplies. From the terminal port of *Fusan* a railway runs to *Seoul*, the

capital. From Seoul one line runs to Moukden in Manchukuo; another parallel to the east coast through the ports of Seishin and Rashin which, unlike their Russian neighbour Vladivostok, are ice-free in winter.

Taiwan (Formosa)

The mountainous forested island of Taiwan was ceded to Japan by China in 1895. Its 5 million inhabitants include a number of aborigines who live in the remoter parts of the interior. Though rising steeply on the east from the Pacific it is bordered by plains on the west. Lying athwart the Tropic of Cancer, Taiwan has a tropical monsoon climate. There are heavy summer rains, but the winters are by no means rainless and frosts are unknown in the lowlands. The forests yield the world's chief supplies of camphor. At one time these evergreen trees, about the height of oaks, were felled and cut into chips from which camphor was obtained. Now less wasteful methods are employed: from the twigs and leaves vapour is distilled, and forced through pipes into vats, where it is condensed in the form of white crystals. Food crops include rice and sweet potatoes; tea, jute, and sugar-cane are grown mainly as cash crops. Minerals comprise coal, copper, gold, and silver. *Taihoku*, the chief port in the north, is linked by rail with Tainan, in the south.

EXERCISES

1. How do you account for (a) the many volcanoes, and (b) the frequent earthquakes in Japan? In what ways do the people guard against earthquakes? Name two areas, outside Asia, and each in a different continent, subject to these phenomena.
2. Give an account of Japan under the headings: (i) Commercial Importance of its Position; (ii) Chief Occupations other than Manufacturing; (iii) Manufacturing Industries and Principal Areas of Production.
3. Select *three* ports in Japan, and in the case of each show how geographical conditions have helped to make it important. Illustrate your answers by sketch-maps.
4. In the case of each of the following give *three* reasons which help to account for: (a) the importance of silk production in Japan; (b) the fact that Japanese farms are small; (c) Japanese overseas expansion.

CHAPTER XIII

THE ASIATIC MEDITERRANEAN LANDS

Gateways to the East

THE Asiatic Mediterranean countries are Turkey, Syria, and Palestine. Their maritime situation and their type of climate link them with the Mediterranean Lands of Europe and Northern Africa. Their position, athwart the western seaboard of Asia, makes them a channel of communication between West and East; and for centuries their ports have been gateways through which has flowed traffic to Mesopotamia and the cities of Central Asia. Goods are still conveyed along age-old routes by camel caravans, but this form of transport is gradually being ousted by the more prosaic motor-car, by aeroplanes flying between Europe and the Far East, and by railways, such as that which, except for a relatively short section, links Turkey with Baghdad. Moreover, oil from Iraqiian wells is brought to the Mediterranean through pipe-lines, which debouch at the Palestinian port of Haifa, and the Syrian port of Tripoli.

In these Mediterranean Lands the summers are hot and brilliantly sunny; the winters showery, the amount of rain decreasing with increasing distance from the Mediterranean. Owing to the light and seasonal nature of the rainfall considerable areas consist of desert, semi-desert, or poor steppe. Crops are restricted to cereals, such as wheat and barley; plants, like vines and olives, which can withstand the summer drought; and citrus and other fruits, cotton, and tobacco, that can be grown on irrigated lands.

Turkey: a Virile Peasant State

As a result of the War of 1914-18 Turkey lost her territory in Europe, with the exception of some 9,000 square miles forming the hinterland of Istanbul. She is now a

relatively small state in Asia Minor, about three times the size of Britain, with a population of 16 millions, the majority of whom are Moslems. In 1923 Turkey, formerly a monarchy ruled by a Sultan, became a Republic. Since then her progress has been rapid. The complicated Arabic script has been replaced by the Latin alphabet used in Western Europe, and modern educational methods have been introduced. Women no longer wear the veil, but are on an

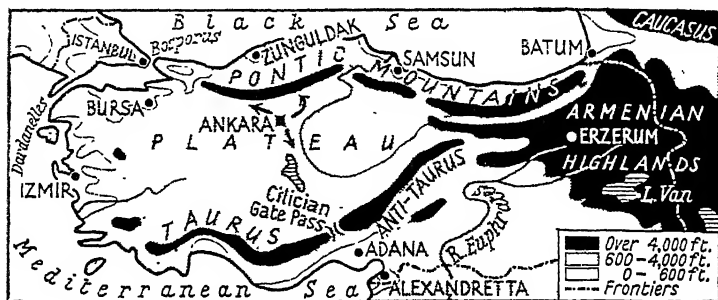


FIG. 42. Turkey and Trans-Caucasia

equality with men. Primitive methods of agriculture are to some extent being replaced by more scientific ones. Rail and road construction is being pushed on as funds allow. There has also been some industrial development, and a number of factories have been erected in the coal-mining area near *Zunguldak* on the Black Sea, and in the Ankara district.

Turkey occupies the greater part of Asia Minor, which is a plateau rising gradually from the Aegean Sea to over 6,000 feet in the Armenian and Kurdistan Highlands in the east. On the north the Plateau is bordered by the Pontic Mountains which rise steeply from the Black Sea; on the south it is margined by the Taurus, whose continuation, the Anti-Taurus, runs north-east. Because of their unstable nature these fold ranges are subject to earthquakes, such as that which in January 1940 occurred in the Pontic area,

causing enormous damage in the vilayet (province) of Samsun. The Taurus almost cut off the Plateau from the Mediterranean. In the south-east, however, the mountains recede somewhat from the sea, leaving the Cilician Plain, approached from the north-west through the Cilician Gate pass. Towards the Sea of Marmara and the Aegean, where the highland rim is more broken, the sunken coast is fringed by islands and indented by openings, the 'drowned' ends of valleys that form routes into the interior.

Most of the rivers flow in deep gorges and suffer from a shortage of water, except in spring when they are swollen with rain and melting snows. Hence they are of little use for navigation. On some of them, however, dams, such as the Culuk Dam 10 miles north of Ankara, have been built to store water for irrigation and power.

The seaward slopes of the mountains are forested. The Pontics, for instance, are clothed with oaks, beeches, pines, and innumerable hazel bushes whose nuts are exported. In the coastal valleys the Mediterranean climate favours the cultivation of vines, olives, and figs. Tobacco is widely grown round Samsun, and cotton in the Cilician Plain, where *Seyhan* (Adana) is the chief town. Mulberry-trees thrive in the valleys opening to the Sea of Marmara, where *Bursa* is a centre of the silk industry. The well-tilled valleys of the Gediz and Menderes are followed by railways leading to *Izmir* (Smyrna), which though no longer an outstanding port still has a considerable export trade in figs.

The mountain rim that margins the Plateau acts as a barrier to oceanic influences, causing the climate of the interior to be extreme and dry. The lack of trees tells of the low rainfall and of ruthless deforestation in the past. The brackish marshes and salt lakes of the inland drainage area in the south are manifest signs of great heat and evaporation in summer. Some parts of the Plateau are little better than desert. Others are clad with rough pasture better suited to sheep and goats than to cattle. The fleeces of the sheep are

used for making rugs, carpets, and homespun cloth; the famous Angora (Ankara) goats yield a fine curly wool, called mohair, which is an important export. The better-watered areas produce wheat, barley, and opium, and in recent years enough sugar-beet has been grown to supply home requirements. Women and men work side by side in the fields, though the men as often as not prefer the more leisurely job of tending the sheep and goats. In many districts farming is carried on by scientific methods, but in others iron-shod wooden ploughs, drawn by buffaloes or oxen, are still used, and grain is threshed by primitive methods and winnowed by the wind (Plate IX).

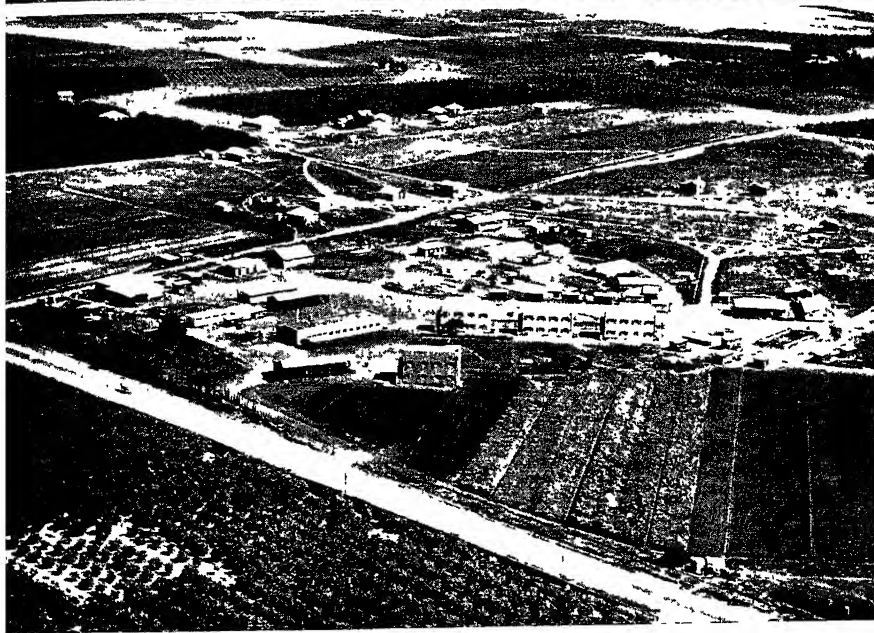
Ankara has replaced Istanbul as the capital of Turkey. Centrally situated it is linked by rail with Samsun, on the Black Sea; Haydar Pasa, on the Bosphorus; Izmir; and, by way of the Cilician Gate, with Seyhan, and the ancient port of Alexandretta, which in 1939 was ceded by France to Turkey. There is a summer air service between Ankara and Istanbul. The old city of Ankara clusters round a hill still crowned by its citadel, but the modern quarters, symbolic of the progressive spirit of the young Republic, stand on the plain.

Trans-Caucasia

North-east of Turkey lie the mountainous Trans-Caucasian states of *Armenia*, *Azerbaijan*, and *Georgia*, which form part of Soviet Russia. The lower slopes of the mountains are forested. Valleys, such as that of the Kura, are cultivated. Railway and pipe-line from the petroleum centre of Baku, on the Caspian, follow the Kura valley to Tiflis, whence they continue to the Black Sea port of Batum.

Syria, Palestine, and Transjordan

This region stretches from Turkey southward to Arabia, and from the Mediterranean eastward to Iraq. Syria is governed by the French under a Mandate from the League

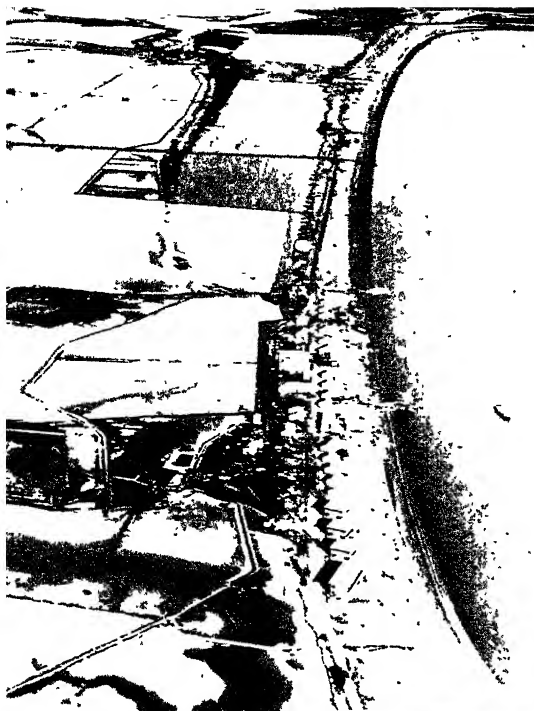


9. THE ASIATIC MEDITERRANEAN LANDS: OLD AND NEW METHODS

(Above) Threshing grain in Turkey by means of a sledge drawn by oxen or horses on a circular threshing-floor: the grain is winnowed (left) by tossing it into the air. But such primitive methods are being replaced by modern ones. (Below) A modern Jewish settlement in Palestine, with an orange plantation (foreground), and a tinne-fruit factory (mid-foreground) (see p. 113).

10. PROGRESSIVE PALESTINE^c

(Top) Potash works on the shore of the Dead Sea, which utilize its exceptionally salt waters for the production of potassium and bromide (see p. 114). (Bottom) Haifa, the chief port of Palestine, and one of the two terminal ports of the oil pipe-line from Iraq. Behind the business section the residential quarters stretch up to the slopes of Mount Carmel (p. 113).



of Nations; Palestine and Transjordan are administered by the British under the same authority.

From 1, the Maritime Plain, the country rises gradually to 2, a Limestone Plateau, which sinks sharply to 3, the Rift Valley, part of the great trough extending south through the Red Sea into Africa. East of this deep trench the land rises sharply to 4, the Eastern Plateau, which descends by a long gradual slope, through the Syrian Desert, to the Tigris-Euphrates valley.

The irrigated districts along the coastal belts of Syria and Palestine present a great contrast to the poor pastoral lands rising to the east. In Palestine much of the land is farmed by recent Jewish immigrants whose response to their environment has been remarkable. By adopting progressive methods, such as deep ploughing and the use of fertilizers, they have greatly increased the yield of land per acre. By irrigation they have converted sand dunes and desert districts into agricultural land, and by draining marshes have done much to combat malaria. Among the crops grown are oranges, grape-fruits, and melons. Oranges ripen in autumn and the picking season lasts until April. The hill-sides are terraced and planted with vines, olives, and mulberry-trees. Neither the vine nor the olive requires artificial watering: the vine has long tap-roots which it thrusts deep into the soil; the olive needs little rain and thrives under the blazing sun, but it cannot stand prolonged frosts. Cereals, such as wheat, barley, and millet, are not confined to the coast-lands, for over most of the region the winter rains provide sufficient moisture for them to be grown. Sown in autumn they are harvested in May or early June.

Beirut, chief seaport of Syria, stands on a bay backed by the richly cultivated terraces of the Mountains of Lebanon, upon whose higher seaward slopes patches of snow linger throughout the year. *Tripoli*, in Syria, and *Haifa*, in Palestine, are terminal ports for oil pipe-lines from Iraq. Haifa is an important naval base, and since the completion

of its new harbour works has become the chief port in Palestine, exporting oranges, lemons, soap, and olive-oil. At *Jaffa*, outlet for a noted orange-growing district, goods are still shipped in lighters. Near this port, *Tel Aviv*, a rapidly growing town, is the chief of the Jewish settlements along the coast (see Plate IX).

From Jaffa, rail and road run up to *Jerusalem*, the historic capital of Palestine, whose associations with three religions draw pilgrims and tourists from all parts of the world. Surrounded on three sides by deep ravines, the city overlooks the limestone tableland, whose surface is broken by low hills and riven by deep wadis. Here and there gnarled olive-trees find a foothold on the dry rocky slopes, while widely scattered villages of mud-built houses vary the monotony of the poor steppes, the home of Bedouin herdsmen who graze sheep and goats over wide areas.

To the east lies the Rift Valley, which from Syria southward grows steadily deeper. In Palestine it is drained by the Jordan to the Dead Sea, whose surface is 1,300 feet below sea-level and whose floor is another 1,300 feet down. This long narrow sheet of water—a rift lake—has no outlet. Owing to the great summer heat and enormous evaporation it is so salt that common salt, bromide, and potash are obtained from it on a commercial scale. It is in fact the only source of potash in the British Empire. Farther north the Jordan Hydro-Electric Power Station, near the Lake of Galilee, supplies electric light and power to much of Palestine.

The road from Jerusalem after descending into the Rift Valley climbs up to Amman, the picturesque capital of *Transjordan*, whence the motor-caravan service continues to Baghdad. Transjordan, a wild mountainous and semi-desert country, has an area of some 35,000 square miles. Of its 300,000 inhabitants the majority are pastoral Arabs, who until recently regarded it as their birthright to raid the more peaceful fellaheen living in the isolated oasis-villages.

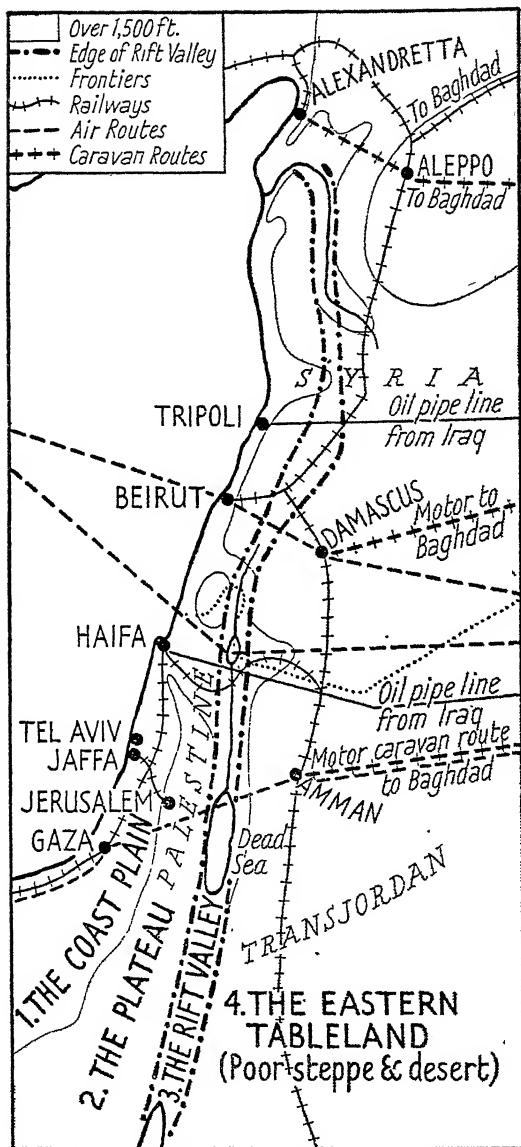


FIG. 43. Syria, Palestine, and Transjordan

The north of the Eastern Tableland lies in Syria. *Damascus*, on the edge of the Syrian Desert, is one of the oldest cities in the world. Its gardens, groves, orchards, and vineyards are irrigated by the waters of the Abana, which comes tumbling down from the mountains of Anti-Lebanon. It is a city of strange contrasts, with spacious thoroughfares lined with modern shops, and narrow winding lanes bordered by tiny booths where merchants, in flowing robes, sit cross-legged behind their wares. And despite its railway station and airport, it is still an important caravan centre, just as it was in Bible times. Eastward the desert route, following a line of springs, descends to Baghdad. Westward road and railway zigzag up the Mountains of Anti-Lebanon, drop to the great Syrian Hollow—part of the Rift Valley—and after climbing the Lebanon Range descend to Beirut and the Mediterranean. A railway runs through the Hollow northward to *Aleppo*, which, with its great walled citadel, mosques, vaulted bazaars, and warehouses, is a collecting and redistributing centre for goods brought by rail and caravan.

Most of the population of Syria and Transjordan are Arabs, devoted adherents of Islam; but in Palestine, owing to Jewish immigration since the War of 1914-18, there are nearly half as many Jews as Arabs. The Jews, who have brought capital, as well as introducing scientific farming methods, are doing much to develop the country, but there is considerable friction between them and their more conservative Arab neighbours, many of whom are nomad Bedouins. The traditional conflict between the 'steppe' and the 'sown' is accentuated by religious differences, and even more by the fear on the part of the Arabs that they will become a minority in the land of their birth.

Cyprus

The British island of Cyprus, about half the size of Wales, lying some 60 miles off the coast of Syria, is inhabited

mainly by people of Greek origin. Owing to deforestation its limestone hills are barren and infertile, but the valleys are cultivated. Sponge fishing is carried on round the coasts. Nicosia is the port-capital.

EXERCISES

1. Write an account of Turkey (excluding the European portion) under the headings: Position, Relief and Drainage, Climate, and Products.

2. (a) Treating Syria, Palestine, and Transjordan as a whole, draw a map to show the following regions into which this area may be divided: (i) the Maritime Plain, (ii) the Western Plateau, (iii) the Rift Valley, and (iv) the Eastern Tableland. (b) Show how the characteristic occupations in any *two* of the regions are related to the environment.

3. Select *one* port and *one* inland town in each of Turkey, Syria, and Palestine. In the case of each describe its situation and the geographical or other causes that have contributed to its importance.

CHAPTER XIV

SOUTH-WEST ASIA

The Thirsty Lands



FIG. 44. South-West Asia

FROM Arabia there stretches north-eastward through Mesopotamia to the Plateau of Iran a region consisting mainly of deserts, salt marshes, and poor steppes where cultivation is chiefly confined to the river valleys and oases. This vast area forms a transitional belt between the Mediterranean Lands and Central Asia. The rainfall, as in the former region, is almost everywhere limited to the winter months,

but so scanty is it that irrigation is essential for cultivation. Disputes between the herdsmen and the cultivators are frequent, for the former pay little regard to frontiers and do not hesitate to raid the lands of the settled and less warlike folk who till the soil.

It will be readily understood that a region with so large a proportion of arid land is but thinly peopled, and, though this area is almost as large as Europe, its total population does not greatly exceed that of the British Isles. Yet it is an intensely interesting part of the world and one that well illustrates the way in which people adapt themselves to their environment.

Arabia

Arabia has an area of 1 million square miles and a population of about 10 millions. Except for the coastal plains, narrow in the west and south but broader in the east, Arabia is a plateau, nowhere less than 1,500 feet high, and rising to about 9,000 feet in Yemen in the south-west, and in the detached highland area of Oman in the south-east. Yemen, which receives fairly heavy summer rains from the south-west monsoon, is noted for its coffee, exported from Mocha. Oman, which has a scanty winter rainfall, is famed for its dates. The district of Nejd, in Central Arabia, has slight rains in spring and autumn, and every valley that intersects the plateau waves with feathery date-palms which almost hide the flat-topped houses and mosques of its villages.

Apart from these highland districts the rainfall is insignificant and most of the country consists of deserts and poor steppes, with scattered oases, or oasis-groups, linked by caravan routes. In the north the desert is rocky and stony in character. In other areas it consists of flat dusty plains over which a motor-car can travel at speed. In the south-east is the true desert with deep soft sand. But after rains when, for a time, the ground is covered with herbage, the Bedouin Arabs migrate to this area with their camels, sheep,

and goats. Like other nomadic tribes living in the interior they move from one grazing ground to another according to the season, visiting the same districts year after year. They pitch their low dark tents around a well whose site is usually marked by a pile of stones. Customs have changed very little with the passing centuries and, as in the days of Jacob, water is drawn from the wells by leather buckets fastened to the end of long ropes.

Every year thousands of pilgrims visit *Mecca*, the birth-place of Mohammed, and Medina where he is buried. There is a road from the Red Sea port of Jidda to Mecca and motor-buses ply between the two towns. Many devout pilgrims prefer, however, to journey from Jidda to Mecca on foot, while others travel on donkeys, camels, or horses.

Aden, a volcanic peninsula to the south-west of Arabia, is a British colony and a refuelling station on the Suez Canal-Red Sea route to the East. It is also an entrepôt port to which are brought, for trans-shipment to larger vessels, coffee and dates from Arabia, and hides, skins, and gums from British Somaliland fronting the African shore. Aden, together with the adjacent British Protectorate, is nearly one and a half times the size of Great Britain.

The Bahrein Islands, in the Persian Gulf, also under British protection, are noted for pearl fishing and petroleum.

Iraq: the Land of the Two Rivers

There is a fascination about Mesopotamia, the seat of one of the oldest civilizations in the world. In the days of the Babylonian Empire its now arid plains were irrigated by innumerable canals, which enabled this almost rainless land to produce such great quantities of grain that it formed one vast and practically unbroken cornfield. But the glory of Mesopotamia faded, for owing to neglect both before and during centuries of Turkish rule the great irrigation works fell into decay and most of the land reverted to the desert. Since Iraq has become an independent country some pro-

gress has been made, but even to-day its population is less than one-quarter that of Egypt, which also depends for its prosperity on irrigation from a great river.

The modern kingdom of Iraq consists of Mesopotamia—the 'the Land between the Rivers'—together with a strip of desert and poor steppe stretching towards the frontier of Arabia, Transjordan, and Syria. The Mesopotamian valley, watered by the Euphrates and the Tigris, forms a trough between the old crust block of Arabia and the young fold mountains marking the edge of the Plateau of Iran. Apart from the desert area Iraq consists of two regions: Upper and Lower Mesopotamia. *Upper Mesopotamia* is a low tableland which stretches from the Highlands of Kurdistan southward as far as an east-to-west line running through Hit (pitch wells) on the Euphrates. The great alluvial lowland of *Lower Mesopotamia* has been built up of sediment brought down by the Euphrates and the Tigris. At one time these rivers entered the Persian Gulf independently, but now they unite to form the Shat-el-Arab, which is steadily extending its marshy delta farther into the sea. So great has been the rate of deposition that in historic times the land has been extended for about 600 miles into the Persian Gulf.

Owing to the low rainfall (Baghdad 7 inches a year), and the great evaporation due to the high summer temperatures, the prosperity of the country depends on the Tigris and the Euphrates. In spring (March to May) the rivers, swollen by melting snows from the Armenian and Kurdistan Highlands and heavily charged with silt, roll down across the plain in heavy flood. In places, such as Hindiya, on the Euphrates, barrages have been built to hold back the flood waters for irrigation. In other districts, where the embanked rivers have raised their beds above the level of the surrounding land, inundation canals, somewhat similar to those of the Punjab, are led off from the main stream. But much water is still raised from river to canal by old-fashioned water-wheels and modern petrol pumps.

Wheat and barley are sown in autumn and harvested in late spring. During summer, when the sun shines down with fierce intensity, cotton and tobacco are cultivated on irrigated lands. Dates, the main export crop, are grown in a belt extending from Basra for 150 miles along the Euphrates. Along this riverain zone the palms rise close to the water's edge and extend to a depth of some 3 miles along both banks. The method of irrigation is interesting, for the incoming tides force the Shat-el-Arab to rise and flood the adjacent groves (see Plate XI).

Outside the irrigated areas the poor steppes are the home of nomads who, with their flocks and herds, migrate every summer for water and pasturage across neighbouring frontiers. But in 1938 a scheme was commenced whereby water was raised from subterranean supplies by windpumps, from which it flowed into long troughs. When this undertaking is completed the steppe will be dotted with wells, which will enable the herdsmen to lead a settled instead of a migratory life. Thus are the geologist and the engineer improving the environment of the nomadic tribes.

Iraq is an important petroleum-producing area. One oil-field lies 30 miles south of Khanaqin to whose refineries the oil is pumped. From the Kirkuk field, also in the east of Iraq, oil is piped for 540 miles to Tripoli (Syria), and 630 miles to Haifa. There are also wells near Mosul.

Basra, the chief port of Iraq, lies a short distance up the Shat-el-Arab, which flows across a marshy delta, local communications being carried on by rush boats. In many villages the flat-topped huts are built of clay mixed with chopped reeds to bind it together. In others the fisher folk live in huts made of reed mats stretched upon a framework of poles, which can be dismantled and moved to higher ground during floods. River steamers can ascend the Tigris to Baghdad, some 500 miles up-stream. The railway from Basra follows the Euphrates as far as the ruins of Babylon, and then runs north to the Tigris and Baghdad, which

stands where the Euphrates most nearly approaches its sister-stream.

Baghdad, the capital of Iraq, stretches along both sides of the Tigris. The principal quarters are on the left bank, but on either side the domes and minarets of many mosques and the feathery crests of countless palms break the flat outline of the level roofs of houses whose great latticed windows look out towards the yellow river. Owing to the exceptionally high spring floods, a pontoon bridge was until recently used for communication between Eastern and Western Baghdad, but now a permanent bridge, designed to withstand the strain, has been built across the Tigris. From time immemorial Baghdad has been a focus of caravan routes linking the Persian Gulf with the Mediterranean by way of the Tigris-Euphrates valley. To-day it is an airport on the route from Europe to the Far East. It is also connected by motor-caravan services with Amman and Damascus; and by rail with *Kirkuk*, a railhead. The Basra-Baghdad-Bosporus Railway, 1,989 miles long, was completed in 1940. From Baghdad it runs up the valley of the Tigris to *Mosul* (at the head of navigation), and thence through Nisibin in Turkey, to Haydar Pass, the terminus.

The Plateau of Iran (Iran, Afghanistan, and British Baluchistan)

Hemmed in on all sides by mighty ranges, and lying in the north-east trade wind desert belt, the Plateau of Iran, with an elevation of about 3,000 feet, is very dry, and its climate is extreme with hot summers and cold winters. There are slight winter rains, but precipitation is mainly in the form of snow on the higher mountains. Few streams reach the sea and the greater part of the plateau is an inland drainage area. The Plateau is divided politically into Iran (Persia) in the west, and Afghanistan and British Baluchistan in the east.

Iran (Persia)

Iran, which is about seven times the size of Great Britain, has only some 12 million inhabitants, or somewhat less than 20 to the square mile. That alone bears witness to the arid conditions of the country. In the fertile district lying between the Elburz Mountains and the Caspian the rainfall is heavy, but with that exception the amount is negligible. The interior of Iran consists of a vast depression into which the streams from the surrounding mountains drain, and either lose themselves in the sands or form lakes or marshes which are extremely salt owing to the great evaporation. In the whole of Iran there is only one navigable river—the Karun, which flows into the Persian Gulf and is linked by a distributary with the Shat-el-Arab.

At least half of Iran consists of sandy or stony deserts strongly impregnated with salt, and so sterile that they do not furnish pasture even for the hardiest animals. Outside the desert areas the poor steppe is able to support flocks and herds, which in winter are fed on the lower lands and in summer are driven by their owners up to the mountain pastures. The camels, sheep, and goats yield milk, as well as hair or wool used for making homespun cloth, and especially rugs and carpets—some woven by the nomads, others manufactured at such famous centres as Tabriz and Meshed.

In the rare oases, and valleys like those in the vicinity of the marginal mountains where snow-fed streams provide water for irrigation, fruits, vines, mulberry-trees, cotton, tobacco, and cereals are grown. Owing to the great summer heat the canals, called *kamats*, are covered in to prevent loss of water through evaporation.

In Southern Iran there are important oil-fields in the Karun Valley, where the oil is contained in limestone, as though the rock were some gigantic sponge. It is piped across sunbaked plains to the refineries at *Abadan*,

on an island in the Shat-el-Arab, whence it flows into the holds of tankers waiting to steam down the Persian Gulf.

Nearly all the chief cities of Iran lie close to the highlands from which they obtain their water-supplies. *Teheran*, the capital, stands on a high plain, south of the Elburz Mountains whose snow-clad crests, crowned by the volcanic peak of Damavend, can be clearly seen from the walled city. Several motor roads meet at Teheran. Westward goes the way to *Tabriz*, the second largest city in Iran, whence a railway runs to Tiflis, in Trans-Caucasia. The eastward route leads to Meshed, while southward another goes through Isfahan, a former capital, and Shiraz, to Bushire, on the Persian Gulf. Another motor road from Teheran traverses difficult country to the railhead of Khanaqin (Iraq), and thence to Baghdad. But times are changing, and, though vast quantities of goods are still conveyed to and from Teheran by camel or motor-caravan, the city is now served by the *Trans-Iranian railway*, completed in 1938, which runs from Bandar Shah, on the Caspian, to Bandar-Shapur, on the Persian Gulf. Including this line, there are now some 1,500 miles of railway in Iran.

Afghanistan

Afghanistan, which forms the most easterly part of the Plateau of Iran, extends up the slopes of the Hindu Kush and the Pamirs. About twice the size of the British Isles, with an estimated population of some 12 millions, it forms a buffer state between Soviet Central Asia and India. Most of this dry and untamed rugged land consists of stony and pebbly deserts, arid plateaux with stretches of rough pasture on which fat-tailed sheep browse, and mighty mountains whose snow-capped peaks dominate the landscape. Here and there in irrigated valleys, like that of the Kabul river, wheat, barley, and vegetables are grown, and fruits including figs, apricots, apples, plums, and cherries. The

sheep furnish wool and mutton, and grease from their tails is used as a substitute for butter.

There are no navigable rivers, no railways, and few good roads. Goods are carried on the backs of ponies or camels. The most important road is that from Kabul, the capital, through the Khyber Pass, to Peshawar, in India. Another road links Kabul with Kandahar, near the frontier of *British Baluchistan*, whence caravans, with fruit and animals for sale, travel to Quetta, the capital of this Indian province.

EXERCISES

1. Describe the Tigris-Euphrates Valley under the headings: (i) Relief, (ii) Climate, (iii) Methods of Irrigation and Chief Crops, (iv) Modes of Transport, and (v) Chief Towns.
2. Show how the chief occupations of the people living on the Plateau of Iran are related to their environment. With what products does this region supply the outside world?

CHAPTER XV THE HEART OF ASIA

Chinese Central Asia

IN the heart of Asia is a region, almost hemmed in by lofty mountains, which is as large as Europe. Deficient in rainfall it has an extreme climate with bitterly cold winters and, except in the higher parts, hot summers. It forms an inland drainage area consisting largely of deserts and poor steppes. This isolated region is Chinese Central Asia, which is divided into three huge territories, *Sinkiang* (Chinese Turkistan), Inner and Outer *Mongolia*, and *Tibet*.

Sinkiang

The arid plateau of Sinkiang, lying between the Altai and the Kunlun Mountains, is divided into two regions by the Tien Shan. The more northerly merges into Russian Turkistan; the more southerly forms the Tarim Basin. The latter depression is drained by the Kashgar and the Yarkand which unite to form the Tarim, a river flowing into the salty marsh of Lop Nor. The sand dunes that cover much of Sinkiang appear to be steadily extending westward and in the course of centuries they have buried once prosperous cities. The steppe-deserts are the homes of wandering herdsmen; the oases of settled folk. In the valleys of the Kashgar and Yarkand rivers, and in other oases watered by snow-fed streams descending from the mountains, cereals, fruits, and vegetables are grown. In such fertile spots stand cities, like Kashgar and Yarkand, which are entrepôt centres and links on east-to-west caravan routes between China and South-West Asia. *Kashgar*, one of the chief cities of Sinkiang, owes much of its importance to its central position near the frontiers of three countries. Its encircling walls enclose a maze of narrow winding streets often blocked by the camels, ponies, and donkeys of caravans, entering or

departing. Its bazaars, where carpets, cloth, silk, jade ornaments, and a variety of goods are displayed, are crowded with Chinese, Afghan, Hindu, and Russian traders, and with nomads from the desert who wish to exchange their hides and wool for such commodities as brick-tea and cotton goods.

Mongolia

Most of Mongolia lies within the Gobi Desert. This arid region, undulating rather than flat, is scored with valleys that only contain water for a few hours after one of the infrequent though heavy rain storms. But despite its arid nature enough rain falls on the margins to provide pasture for the animals that may be seen grazing around the encampments. The nomadic life prevailing in the dry and less developed areas of Central and South-West Asia is a direct result of the environment. 'Among the men in such tribes the thing that counts is the ability to brave danger, fight with beasts if necessary, herd sheep to safety in a storm, follow straying horses and camels all day and all night, or make a fierce raid for plunder and vengeance.' In most cases action is swift and short, and as soon as it is over the nomad takes his ease, and, except for an hour or two on horseback each day, leaves much of the work to his women folk, who milk the animals, prepare the sour milk and cheese, weave rugs and carpets, and beat the felts from which the tents are made.

Inner Mongolia is still under some measure of Chinese control, but Outer Mongolia is now under the influence of Soviet Russia. Its chief town, *Urga* (100,000), is a caravan centre, where east-to-west routes meet that running from Peiping northward to Irkutsk, in Siberia.

Tibet: A Mountain Environment

Vast ranges must be crossed to reach Tibet, for the great tableland is separated from Sinkiang by the Kunlun Mountains, and from India by the mighty wall of the Himalayas.

To the east, routes, though difficult, are somewhat easier, for they follow the upper valleys of the Hwang-ho and the Yangtze-kiang which lead to China. The Tibetan plateau, which has an elevation of from 14,000 to 17,000 feet, is crossed by ranges separated by the valleys of the last-named rivers, and those of the upper Indus, the Tsangpo (upper Brahmaputra), and their tributary streams. Because of its great height above sea-level, Tibet has a severe climate. It has been described as the loftiest, coldest, windiest, and most barren country in the world.

It is not surprising that this desolate land, which has an area of nearly half a million square miles, is thinly peopled. Estimates vary, but the population is probably somewhat less than a million. Only the south is permanently inhabited, and in this part of the country most of the people are found in the valleys or intermont plains, which are less exposed than the higher areas. Gorges, such as that of the Tsangpo, are forested, but for the most part trees are few. In the valleys barley and other hardy cereals are cultivated, and under especially favourable conditions fruits, including peaches, can be grown. But the Tibetans are in the main a pastoral people, their chief domestic animals being yaks and sheep. The yak is a remarkable example of the way animals adapt themselves to their surroundings. Its shaggy coat enables it to withstand the great cold. It is extraordinarily hardy, and so surefooted that it can retain a hold on steep rocky surfaces, cross glaciers, and make its way along tracks deep in snow. It thrives on the coarsest herbage, but it is interesting to note that it will not eat cereals, which, owing to climatic conditions, are not indigenous to Tibet, but were introduced into the country by Chinese colonists. Besides being the chief transport animals, yaks and sheep yield hides, wool, flesh, and milk. Nearly all their milk is made into butter, summer supplies being stored in bags for use during winter when they are especially valuable as a heat-giving food. The butter is usually taken mixed with tea.

The chief minerals worked are gold, borax, and salt.

Most of the villages are situated on the more sheltered sides of the valleys in strong defensive positions. *Lhasa*, the capital and only town of any size, standing in a tributary valley of the Tsangpo, is the seat of the Dalai Lama, the head of the government, and the spiritual head of Lamaism, a form of Buddhism practised by the majority of the Tibetans. *Gyantse*, on another tributary of the Tsangpo, is a trading centre on the route to Darjeeling, India. In winter Tibet is entirely shut off from the outside world, but in summer caravan trade is carried on with India over Himalayan passes, between 14,000 and 18,000 feet high. Trains of coolies, carrying brick-tea, follow the Yangtze to the south-eastern margin of Tibet, where their loads are transferred to yaks.

The effect of environment on national character is well exemplified in the Tibetans, for though they are akin to the Chinese and their country was colonized from China, yet there are striking differences between the two peoples. The Chinese are agriculturalists. They do not keep flocks and herds and use little or no milk and butter; whereas the Tibetans, adapting themselves to their surroundings, are mainly a pastoral race. And even those Tibetans who live in villages show traces of the nomad life, for their houses are usually as sparsely furnished as the tents of wandering herdsmen. On the other hand, the humblest Chinese dwelling has its chairs, table, and bedsteads. The Chinese will not sleep out of doors except under dire necessity; the Tibetans often pass the night on the flat roofs of their houses in preference to resting inside, and travellers think little of sleeping in the open even when the ground is thick with snow.

Soviet Central Asia or Russian Turkistan

Soviet Central Asia, or Russian Turkistan, with an area of over a million square miles, stretches from the Caspian Sea to the slopes of the Pamirs and the Tien Shan. On the

south the Kopet Dagh and other fold ranges shut off Turkistan from the Plateau of Iran, but on the north only low hills divide it from Western Siberia, a fact which facilitated Russian expansion into Central Asia. Lying far from the ocean, this huge region has a scanty rainfall and an extreme climate. About 50 per cent. is desert, 40 per cent. poor steppe, and less than 10 per cent. suitable for cultivation.

Forming part of the great inland drainage area of Asia, Russian Turkistan depends for its water almost entirely on the snow- and glacier-fed streams which rise on the ranges to the south and south-east. Chief among these rivers are the Amu Daria (1,300 miles), and the Syr Daria (1,100 miles) flowing into the Sea of Aral, and the Ili draining into Lake Balkash. Both the Amu Daria and the Syr Daria are navigable for several hundred miles, but their main value is for irrigation. Most of the lesser streams used for this purpose become so diminished in volume that they finally disappear in the sands, or end in *terminal oases*, like that of the Murgab used to water the district round Merv. The magician's art could scarcely produce a greater contrast than that between the sun-baked steppe-desert and the irrigated areas with their corn lands, orchards, vineyards, and cotton fields, the last-named covering many acres in the valleys of the Amu Daria, the Syr Daria, and the Zerafshan (see Plate XI). This is the chief cotton-growing region in the U.S.S.R. In recent years new irrigation works have enabled the cultivated area to be trebled, but, in order to save unnecessary transport the bulk of the cotton, formerly sent to mills at Moscow, is now manufactured in this area at *Ferghana*, *Ashkabad*, and *Tashkent* (585,000), the largest city in Soviet Central Asia, which is situated near the foot of the mountains on a tributary of the Syr Daria. There are oil-fields at *Ferghana* and *Bukhara*. The latter city, once a stronghold of the Moslem faith, lies in the valley of the Zerafshan; as, too, does *Samarkand*, city of Tamerlane,

greatest of those Mongol leaders who overran Turkistan in the fourteenth century.

Large non-ferrous metal works, which have been established recently in Soviet Central Asia, include a great lead-zinc combine at *Chimkent*, and a copper refinery at *Pribalkhash*, on Lake Balkhash, which smelts copper mined north of the lake over coal from the *Karaganda coal-field*, one of the newest industrial regions in the U.S.S.R. The town of *Karaganda*, which did not exist in 1926, had in 1946 a population of 166,000. The *Central Asian Railway* runs down the valley of the Syr Daria and thence to Moscow. The *Turkistan-Siberian Railway*, popularly known as the *Turksib*, runs from the Trans-Siberian Railway at Novo-Sibirsk, along the foot of the mountains to Tashkent, whence it passes through Bukhara to Merv. Leaving this oasis the line strikes westward across the burning sands of the desert, running near the base of the great mountain rampart which separates Turkistan from Iran. So through Ashkabad, nourished by a mountain stream, the railway reaches Krasnovodsk, set in an amphitheatre of hills, upon the shores of the Caspian Sea.

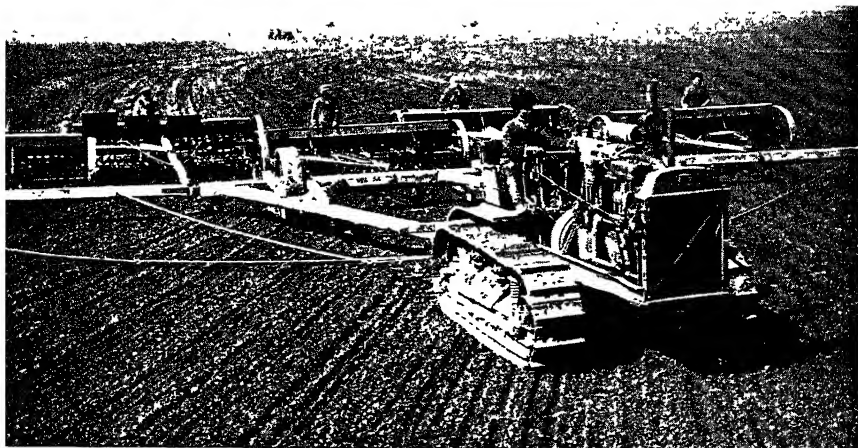
EXERCISES

1. Show how their environment has affected the lives of the people living in *two* of the following regions: (i) Mongolia, (ii) Tibet, (iii) the valley of the Syr Daria.
2. Name *one* region in Asia where the following animals are used for transport, draught, or similar purposes: (i) sheep, (ii) camels, (iii) yaks. In the case of *one* of these animals describe in what other ways it is useful to man.
3. With the aid of your atlas describe a railway journey from Krasnovodsk to Novo-Sibirsk. Give an account of the scenery and the occupations of the people in the regions through which you pass.
4. Why are the chief towns in Central Asia situated on rivers? Select *three* of them, and draw sketch-maps to show the importance of their position.



11. IRRIGATING THE ARID LANDS

(Above) Iraq. Date groves near Basra, on the Shat-el-Arab (see p. 122). The incoming tides cause the irrigation canals to rise and flood the roots of the palms, which 'like their feet in the water and their heads in the blazing sun'. (Below) In Soviet Central Asia irrigation is necessary: the man (right) is blocking up one of the channels, fed from the Syr Daria, marked by trees in the distance. The land will be planted with cotton (see p. 131).



12. CHANGING RUSSIA

(Above) One of the new industrial towns, which have grown up in Russia's recently developed Ural-Eastern Areas. The blast furnaces and steel producing plants (centre) form single establishments. (Below) A collective farm on the steppes, with five seeders attached to a caterpillar tractor, made at Chelyabinsk (Urals).

CHAPTER XVI

SIBERIA

A Vast Storehouse

SIBERIA extends from the Ural Mountains to the Pacific, and from Turkistan and Mongolia northward to the Arctic Ocean. This huge territory, which forms the eastern part of Soviet Russia, is considerably larger than Europe. Large tracts, if not entirely unexplored, are little known, and perhaps it is not surprising that there are people who still think of Siberia as a desolate waste where political prisoners toil amidst ice and snow. This, of course, is not the case. Siberia is a storehouse of natural resources and a land of enormous possibilities. Realizing these facts, the Soviet Government has done much to develop this region, whose future depends largely on increased transport facilities.

Like Canada, which lies in similar latitudes, Siberia has a continental climate, though one that is somewhat more extreme than that of the Dominion. Except along the Arctic coast, the summers are warm. But the winters are intensely cold. At this season practically the whole of Siberia has a temperature below zero, and rivers and lakes are frozen to a depth of several feet. Most rain falls during thunderstorms in summer, but though the annual total is small the winter snows help to compensate for this.

Western Siberia, stretching from the Ural Mountains to the Yenisei river, is a continuation of the great European Plain. Beyond the Yenisei *Eastern Siberia* is a mountainous region intersected by deep valleys cut by rivers flowing northward to the Arctic Ocean. This region, like North-East Canada, is composed of some of the oldest rocks (Pre-Cambrian) in the world, which have been worn down by the action of ice, running water, and other weathering agents. Between the Yenisei and the Lena is a low plateau,

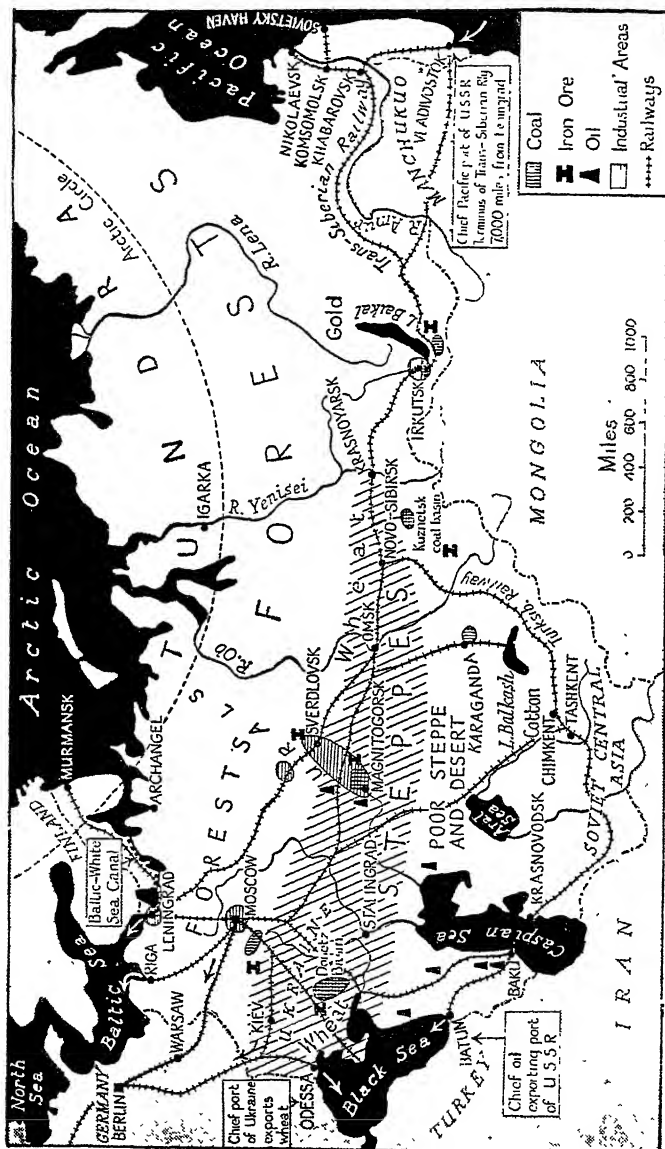


FIG. 45. Siberia: Natural Regions

east of which the land rises steadily to the Yablonoi and other ranges of the North-East Highlands.

We may divide Siberia into three natural regions: the Tundra, the Cold Forest Belt, and the Steppes. Eastern Siberia lies wholly in the Tundra and Forest Belt.

The Tundra

This vast and desolate plain extends from the Cold Forest Belt northward to the Arctic Ocean, whose shores are ice-bound for most of the year. For about eight months the tundra is frozen and buried in snow, and even in summer the ground never thaws for more than a few feet. During spring the ice melts earlier in the upper and middle courses of northward-flowing rivers, like the Yenisei, than it does in their lower reaches where the water, pouring down in heavy flood, and unable to escape through normal channels, spreads over the still frozen deltas, forming marshes and swamps.

Owing to the severe climatic conditions the prevailing vegetation consists of mosses and lichens, though here and there are dwarf birches, stunted willows, and low berry-bearing bushes which seldom reach a height of more than 1 or 2 feet. In the short summer, when daylight is continuous, the ground is carpeted with flowers. At this season birds fly north to nest, and animals, such as the reindeer, the fox, and the wolf, leave the margin of the forests and move towards the Arctic Ocean. The few people who live in the tundra, such as the Samoyedes and Tunguses, exist chiefly by hunting, fishing, and herding reindeer.

The Coniferous Forests

Towards the south the tundra gradually merges into the Cold Forest Belt, the mysterious *taiga*, which extends from east to west for over 4,000 miles and from north to south for distances ranging from 1,000 to 2,000 miles. In Siberia the *taiga* covers an area about six times the size of the British

Isles. Among the chief trees are pines, spruces, larches, and other coniferous softwoods, while in the south there are deciduous trees, such as poplars, with willows in the valleys. In spring and summer it is difficult to travel through the forests, for the undergrowth is dense and the valley bottoms swampy and impassable. With the approach of autumn the ground begins to harden, and the foliage forms a mass of varied colour, ranging from the pale green and the greenish-yellow of the alders, and the rich dark green of the pines, to the flaming red of aspens, and the carmine of the mountain ash. Soon comes the winter, when the frozen rivers and lakes, and the deep hard snow which covers the irregularities of the ground, make transport easy. Now the trapper on his snow-shoes, accompanied by his hardy dogs, sets off into the forest seeking ermine, sable, fox, bear, squirrel, and other animals. The lumberers, too, are busy felling trees and hauling them on sledges over the frozen ground to streams where they await the spring thaw. In summer timber rafts may be seen floating down the Yenisei to the saw mills at *Yeniseisk*, or farther down-stream to the new port of *Igarka*, whence the timber is shipped to Europe during July and August by way of the Arctic. Largely owing to transport difficulties the lumbering industry of Siberia is not so developed as that of Canada, and only the more accessible areas on the southern margin of the forest belt, or along rivers, such as the Amur, Yenisei, and Pechora (European Russia), have as yet been opened up.

Another occupation of growing importance in the forest belt is mining. The ancient bed-rock of Eastern Siberia is rich in gold, coal, iron, salt (in the Angara valley) and other minerals, but with the exception of gold much of this wealth has yet to be won. The principal gold-fields are the *Lena Gold-field* on the Vitim Plateau north of Lake Baikal, and the *Aldan Gold-field* still farther north. Hitherto, development has been hindered by lack of good transport facilities, but a railway is now being built to link this gold-mining

area with the Trans-Siberian Railway, and with Soviet Haven, on the Pacific. Throughout the eastern *taiga* much gold is obtained by placer mining, for, thanks to prolonged denudation, particles of gold from disintegrated rocks have been concentrated in the beds of streams.

The Steppes

The steppes of Western Siberia form part of the great temperate grassland belt extending through European Russia to the Black Sea. Here they stretch before the eye as boundless plains, there they are gently undulating, and in some districts they rise into low swelling hills. In most parts the rainfall, though enough for grasses and cereals, is insufficient for trees, except in the valleys. Though excellent wheat is grown the yield per acre is low, and owing to the cost of carrying, over long distances by rail, such a heavy and bulky commodity, farmers tend to concentrate on dairying, which is now the leading industry in the north of the Siberian steppes. Thousands of tons of butter are dispatched each year in refrigerator cars to Moscow, Leningrad, and other markets in European Russia. Though the rail haul is long and expensive, the cost is justified, for butter is in great demand and takes up far less room than wheat of equal value. Farther south the rainfall is less and the Khirghiz steppes, where Siberia merges into Turkistan, are the home of nomadic herdsmen. In winter they pitch their yurts in a sheltered position beside some lake or stream. In spring they travel across the steppes, and in summer, when the grass is parched and withered, they move to higher slopes where the pastures are still fresh and green.

Recent Developments

We have seen that the future of Siberia depends mainly on transport, for transport and development march hand in hand. The railway net is steadily being extended, yet at present it is quite inadequate to the needs of a country

where goods have to be hauled enormous distances to world markets. It is true that Siberia has thousands of miles of navigable waterways, but they are frozen for nearly two-thirds of the year, and of her four greatest rivers the Ob, the Yenisei, and the Lena run northward, through an inhospitable region, into the Arctic, while the Amur flows through another sparsely populated area into the North Pacific. Hence in Siberia there is no waterway whose value even approaches that of the St. Lawrence-Great Lakes. In summer some trade is conducted by river, more especially in bulky and heavy produce, such as wheat and timber, the former moving southward to the Trans-Siberian Railway, the latter northward to the Arctic. In winter local transport is carried on by sledges—the universal vehicle at this season—drawn by rough-shod horses and ponies.

Numbers of the older towns in Siberia, such as *Tobolsk*, at the junction of the Irtysh and the Tobol, rose up at confluence points. Many, however, now lie at a considerable distance from the railway, as do the majority of villages, whose log houses straggle on either side of the broad track that forms the only street.

The building of the *Trans-Siberian Railway* marked the first step in the opening up of Siberia. With the completion of the line, recently double-tracked throughout its entire length, other towns became important because they stood where the railway crossed a navigable river, at points where goods brought by water could be forwarded by rail or vice versa. Such a town is Novo-Sibirsk, on the Ob, the capital of Western Siberia, and the junction for the Turkistan-Siberian Railway. However, this town owes much of its recent growth to the fact that it stands on the western margin of the *Kuznetsk (Kuzbass) Coal Basin*, one of the industrial areas now being developed in Siberia, whose output is second only to that of the Donetsk Basin in the Ukraine region of European Russia. Coal is dispatched to the Ural industrial area from which iron ores are brought

back to supplement Kuzbass supplies. During the last few decades heavy iron and steel, and light metal and chemical industries have been set up, and thermal power stations for generating electricity erected, in the Kuznetsk area. The remarkable development of this region is reflected in the growth of the three largest towns. In 1900 the population of *Novo-Sibirsk* was only 5,000, in 1936 it was 120,000, by 1940 it had risen to 405,000; the mining centre of *Kemerovo* had 21,730 inhabitants in 1936, and 134,000 in 1940; and the population of *Stalinsk*, the chief iron and steel centre, rose from under 4,000 in 1936 to 170,000 in 1940.

At *Omsk* (281,000), on the Irtysh, the lines from Leningrad via Perm, and Moscow via Chelyabinsk, unite. Thence, the Trans-Siberian Railway, after passing through Novo-Sibirsk, skirts the Kuzbass industrial area, a branch running to the old city of *Tomsk* (141,000), which manufactures aeroplanes. The main line continues through increasingly wooded country to *Krasnoyarsk* (189,000), on the Yenisei, beyond which the railway traverses rugged forested uplands. Descending the valley of the Angara, flowing northward from Lake Baikal, the line runs past picturesque villages, the homes of trappers, miners, and lumberers, to *Irkutsk*. The position of this city, at a point where land and water routes meet the railway, has helped to make it the chief centre in Eastern Siberia; an entrepôt point for gold and furs, and a focus of caravan routes, of which one of the chief is that from China, by way of Urga, whence tea and other goods are brought by camel or motor transport.

Rounding the southern end of Lake Baikal—the third largest fresh-water lake in the world—the railway runs to *Chita* and shortly afterwards divides. One branch traverses the mountainous country and, passing over steep embankments, and through deep cuttings leading to long tunnels, finally reaches the Plain of Manchukuo across which it runs through Harbin to Vladivostok. The other, which runs entirely through Russian territory, descends the Amur

Valley to Khabarovsk, and thence turns south to *Vladivostok*, which by this route is nearly 7,000 miles from Leningrad, the journey taking ten days. Standing on a hill-encircled bay on the western shore of the Sea of Japan, Vladivostok is Russia's chief Pacific port and naval base, but its trade is handicapped because its harbour is ice-bound in winter.

Since 1941 the lower Amur Valley has been the scene of much industrial development. Coal and iron mines have been opened up, and in their vicinity at the river ports of *Khabarovsk* and *Komsomolsk* ('City of Communist Youth') have been established iron and steel plants, and oil refineries served by tankers that bring oil from Sakhalin. Newly constructed railways include a line from Khabarovsk to Nikolayevsk, at the mouth of the Amur, and another linking this line with Soviet Haven.

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NORTH AMERICA AND ASIA: COMPARISON AND CONTRAST

Size, Position, and Relief

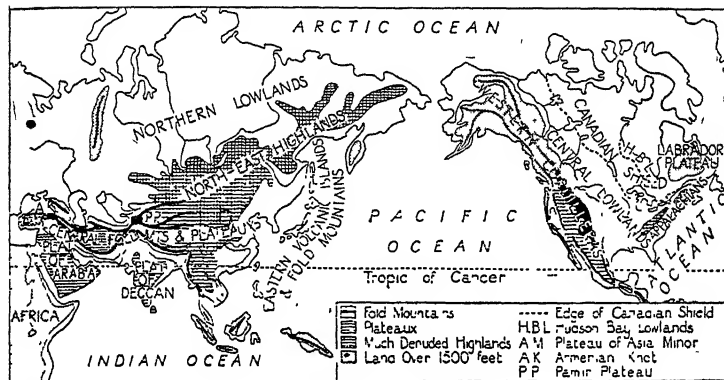


FIG. A. Physical Features

IN some respects North America and Asia show marked resemblances; in others they display striking differences. Asia is more than three times the size of North America, is more compact, and has a relatively shorter coast-line. Asia is roughly rectangular in shape, North America tapers to the south. Hence there is nothing in the latter continent to correspond to Arabia and India, though the relative positions of Mexico, Central America, and the West Indies may be compared to those of the Malay Peninsula and the East Indies.

North America and Asia occupy very similar positions as regards the Pacific: at the Bering Strait they are less than 40 miles apart, but towards the south, several thousand miles of ocean lie between them. Central Canada corresponds to Siberia, the Eastern United States to China. The globe shows that the two continents almost encircle the Arctic, and though this ocean has a negative rather than a positive value, it affects climate, settlement, and communications along their northern shores.

The fold mountains margining the Pacific are represented in North America by the Western Cordilleras, which rise steeply from the ocean, and in Asia by a fringe of volcanic islands, enclosing almost land-locked seas. Hence, while the continental shelf is narrow along the western seaboard of North America, it is wide off part of the mainland of Asia. This has an important effect on human activities. The marginal seas, such as the Sea of Japan and the South China Sea, which abound in fish, have encouraged a maritime life among the people living around their shores. Only in British Columbia and Alaska, where, too, there are important fishing-grounds, is the Pacific coast of North America festooned with islands, and this strip apart, good harbours are singularly lacking. By way of contrast, the Atlantic seaboard has many good openings, at the head of which stand most of the chief seaports in the continent.

The direction and extent of the mountain areas has had an important effect on the development of North America and Asia. The former continent, where the feature lines run from north to south, falls into three major divisions: (1) the Western Cordilleras, with their fold ranges and intermont plateaux, (2) the Eastern Highlands, and (3) the Central Plains, lying between them, which stretch from the Arctic to the Gulf of Mexico.

In relief Asia is strongly at a disadvantage compared to North America. This is primarily due to the great system of Fold Mountains and Plateaux, running from east to west. Together with the North-East Highlands, it forms a barrier to climatic influences and communications between the Northern Lowlands and South-East Asia. Covering an area equal to half that of North America, these mountains occur in latitudes which in America comprise the most productive and densely peopled regions. Yet so high, arid, and inaccessible is the Central Mountain System of Asia that there is scarcely one person to each of its 4 million square miles.

North America and Asia contain some of the greatest rivers in the world. Those draining north, such as the Yukon and the Mackenzie in the former continent, and the Yenisei and the Lena in the latter, would provide splendid waterways were it not that they flow into the Arctic, and are frozen for two-thirds of the year. But the importance of the rivers of South-East Asia can scarcely be over-estimated: streams, such as the Ganges and the Yangtze, furnish water for irrigating vast tracks in their alluvial valleys, which support one of the densest populations in the world. In the Inland Drainage Area of Asia, centring on the Caspian Sea, the Sea of Aral, and Lake Balkash, the only fertile areas are those which can be irrigated from the rivers. Similarly, in North America irrigation is important (i) in the Great Basin of Inland Drainage round the Great Salt Lake and in other arid areas, notably in the West; and (ii) in California because of the seasonal nature of the rainfall. But outside these regions the well-distributed rainfall makes artificial watering unnecessary in most regions. The chief use of the North American rivers lies, however, in the fact that their falls provide power for generating electricity.

Temperature, Ocean Currents, and Rainfall

As North America and Asia lie in similar latitudes there are marked climatic resemblances between them, though, owing to its greater extent, Asia has the more extreme climate. Over much of the interior of both continents the summers are hot. In winter more than half of each continent has a temperature far below freezing-point, but though agricultural activities are, of course, at a standstill lumbering is carried on. In the tropical regions temperatures are uniformly high.

The oceans moderate the climate of the coastal areas. Note the direction of the isotherms on Fig. D, which well illustrates this fact. The ocean currents also have a marked effect on the climate of these regions. In the Pacific the

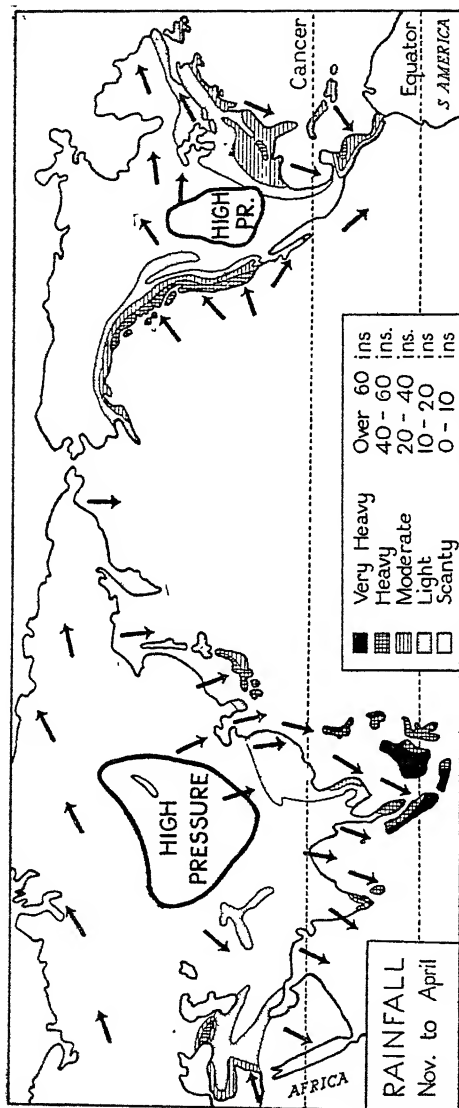


FIG. B. Rainfall, November-April

Note (a) the general west-to-east movement of the air over the north of both continents; and (b) the effect of the high-pressure belt, which causes the winds to blow more strongly off the east coasts in winter than in summer.

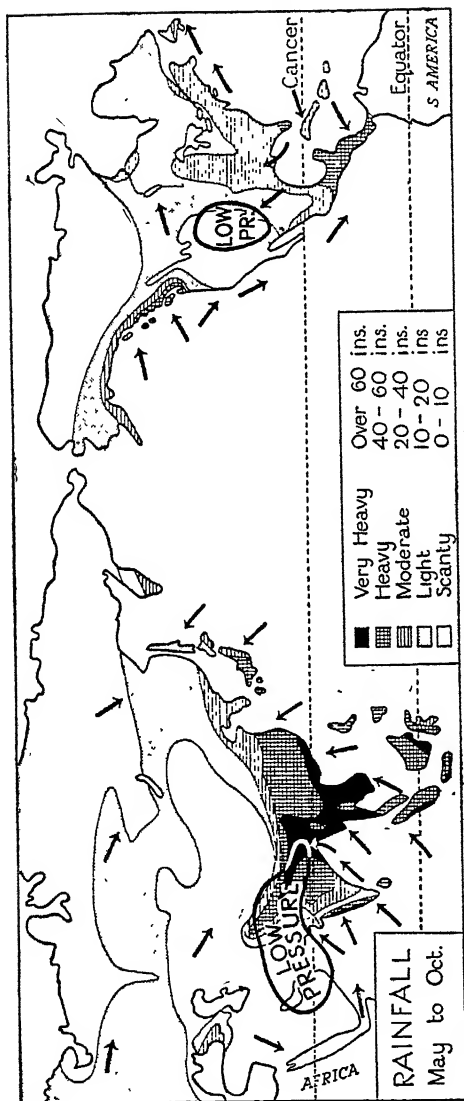


FIG. C. Rainfall, May-October

(1) Note the effect of the low-pressure belt, with in-flowing winds, which bring summer rains to the south-east of both continents. (2) Compare this map with map B and note the regions which receive rain (a) mainly in winter, and (b) at all seasons.

Kuro Siwo flowing north along the east coast of Asia raises the temperature, but the cool *Californian Current* travelling south along the western seaboard of North America lowers the temperature of adjacent lands. The warm waters of the

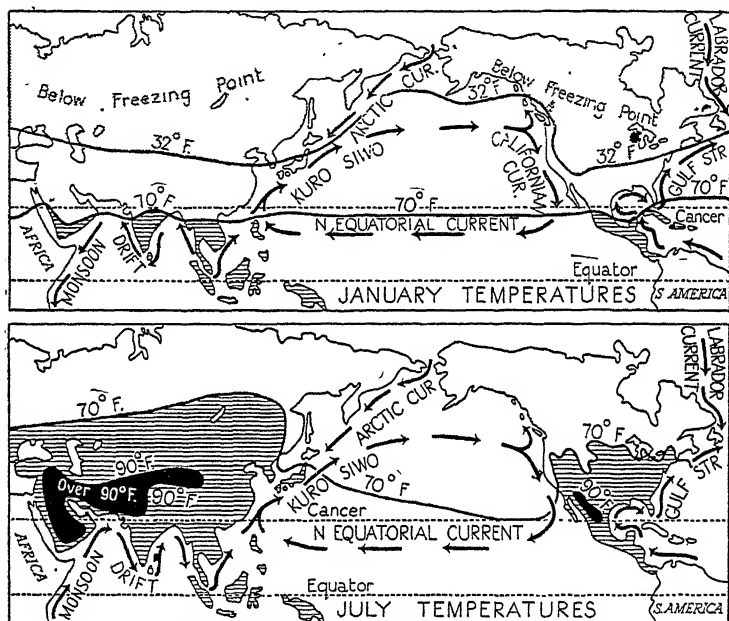


FIG. D. Temperature and Ocean Currents

Gulf Stream raise temperatures along the Atlantic seaboard of the United States. The cold *Labrador Current* chills Labrador and Newfoundland, while its Pacific counterpart, the *Kurile Current*, reduces the temperature of the *Kamchatka Peninsula* in Asia.

Over the north of both continents there is a general movement of air from west to east. The on-shore westerlies cause rain throughout the year along the coastal areas of British Columbia and Alaska. The prairies and the steppes receive most of their rain in spring and early summer when

it is very beneficial to the natural vegetation and crops. South of latitude 40° the north-east trades bring rain to the Southern States, Central America, and the West Indies. California, whose climate resembles that of the Asiatic Mediterranean Lands (Syria, Palestine, &c.), receives rain from the westerlies in winter. But summers are dry because at this season California lies in the off-shore trade wind belt.

The Californian Desert, and the chain of arid plateaux and basins lying between the ranges of the Western Cordilleras, are relatively small in area compared with the great desert tracts, which extend across Asia from Arabia to Mongolia. But the same causes are at work in both regions: the coastal deserts are mainly due to off-shore winds, those in the interior to mountain barriers which prevent moisture-laden winds from reaching them.

In both Asia and North America there is in the interior a region of high pressure, with outflowing winds in winter, and a region of low pressure, with inflowing winds during summer. In North America the south-east trades are deflected up the Mississippi Valley during summer, thus increasing the rainfall at this season. But the effect of the changes in pressure, which cause the seasonal winds, is most marked in Asia. South-East Asia receives practically the whole of its rain during the summer, when the moisture-charged monsoon winds, blowing from the ocean to the low-pressure area, cause torrential downpours. But the winters are dry, because at this season the monsoon winds blow outward from the cold high-pressure area towards the sea. The monsoons are the most striking climatic feature of Asia, and their effect is best seen in India, where marked high- and low-pressure areas occur in the North-West.

Vegetation and Crops

The tundra, with its scanty vegetation, the coniferous forest belt, and the steppes of Asia all have their counterparts in North America. The Siberian forests cover a

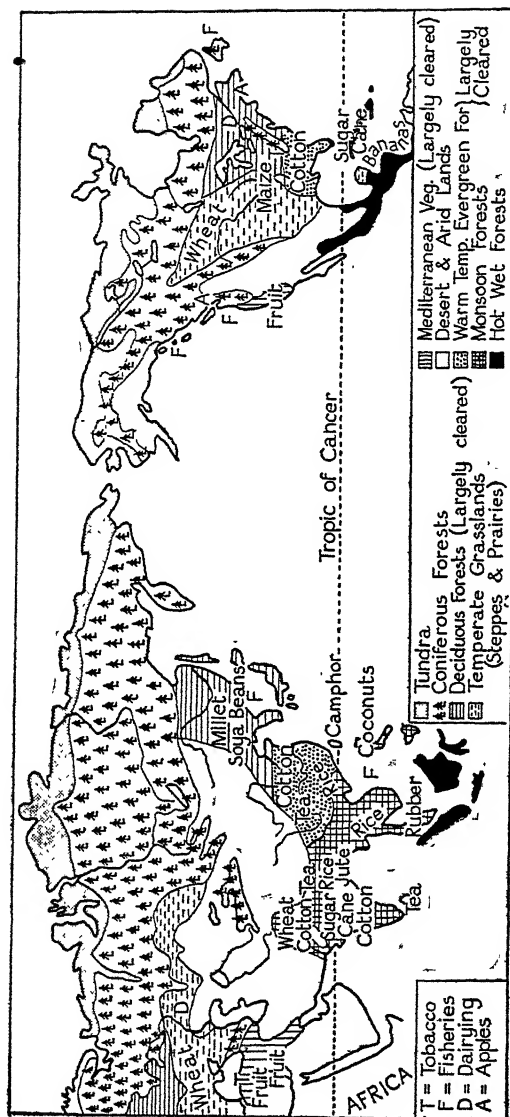


FIG. E. Vegetation and Crops

greater area than those of Canada, but owing to the more rigorous climate, and to the presence of vast marshy areas, they do not contain such good timber. They are farther from world markets, and hydro-electric power has not been utilized, as in Canada, where it has played so great a part in the development of the lumber industry.

Likewise, both geographical and human factors account for the fact that the Asiatic

steppes have not been developed to the same extent as the prairies. Conditions of climate, relief, and soil are similar in both regions, which are especially well adapted to growing cereals in the wetter areas, and stock-rearing in the drier ones. But the transport facilities provided by the Trans-Siberian Railway cannot compare with those furnished by the network of lines serving the prairies. In the drier areas of the steppes many people are still nomadic herdsmen, but in the corresponding areas in North America, such as the High Plains, ranching is a highly organized industry.

The forests of Central America may be likened to those of Burma: in the former mahogany, and in the latter teak, are the most valuable trees. But owing to the fact that North America does not extend so far south as Asia, there is nothing in that continent comparable to the equatorial monsoon forests of Malaya and the East Indies, where rubber is one of the leading products.

Wheat and maize are the chief grain crops of North America; rice and millet of Asia. Canada is the leading wheat-exporting country in the world. In the United States maize is used mainly for fattening hogs and cattle. In most of the Monsoon countries the supply of rice is quite insufficient for the local demands, though Burma, with a relatively small population, produces a surplus for export. Millet is the principal crop in the drier areas. In Manchukuo soya beans are the leading cash crop. Sugar is an important export crop in Cuba, Java, and the Philippines. But though India grows more sugar than any other country in the world the bulk is consumed at home. India and Ceylon lead the world in the production of tea. From a climatic point of view there seems no reason why this crop should not be grown in tropical and sub-tropical North America, but here the human factor enters into the question. A plentiful supply of cheap and skilled labour is required for tending the plantations

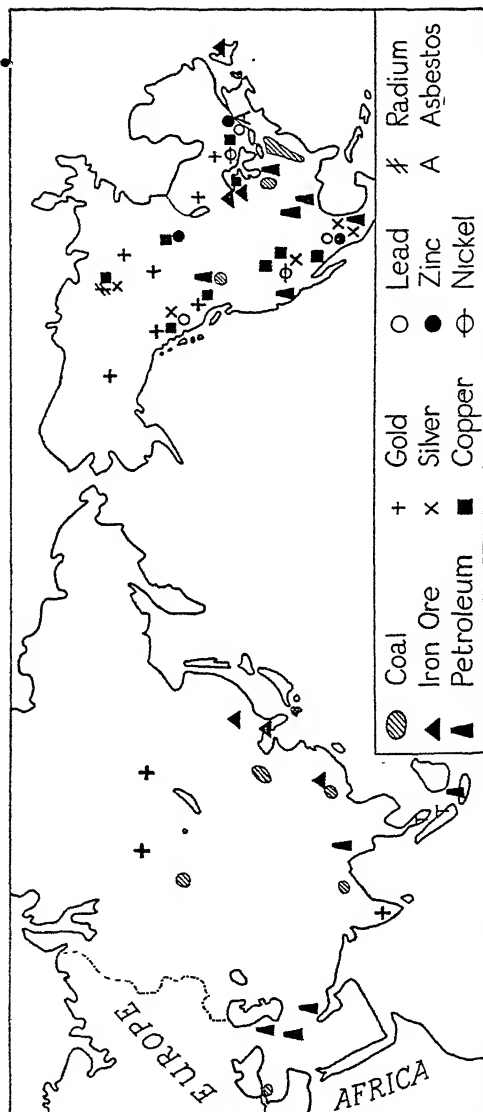


Fig. F. Minerals

and picking the crop, and successful tea cultivation is, therefore, limited to those countries where labour is both abundant and cheap. In the Monsoon Lands rates of pay are small compared with those in Canada and the United States, but it must be remembered that in the East the cost of living is low.

Excluding food crops, cotton is the leading cash crop in the United States, and in monsoon countries, such as India.

Minerals

Asia has probably greater mineral resources than any other continent. Malaya ranks as the foremost country in the world for tin; Iran, Iraq, and the Dutch East Indies are the important petroleum-producing countries; coal is mined in Japan, India, and China, and the reserves in the last-named country are believed to be surpassed only by those of the United States. But taking Asia as a whole, mineral production is small compared with North America, partly owing to lack of organization, except where this has been undertaken by Europeans and Japanese, and partly to transport difficulties.

The United States produces about one-third of the world's coal, the bulk of her supplies being obtained from the Appalachian field. She is also one of the leading producers of iron-ore, the Mesabi mines alone yielding one-quarter of the world's supply. From the United States, too, comes 60 per cent. of the world's petroleum, and it must not be forgotten that this product, besides furnishing petrol, is one of the chief sources of lubricating oil, which is as essential to engines as fuel. Thus the United States is exceptionally rich in those three material resources—coal, iron, and petroleum—which control the world to-day. But it is a grim commentary on our civilization, when the power of a nation depends on its ability to mine coal, use this coal to convert iron into steel, and to convert steel, which might be turned to peaceful account in machinery and merchantships, into weapons of destruction—warships, aircraft, guns, and tanks, all of which depend for their efficient working, in greater or less measure, on petroleum products.

The Western Cordilleras and the Canadian Shield contain an abundance of metallic ores. In the United States and Canada modern mining methods are the rule; in many areas in Mexico lack of scientific production greatly handicaps the output. The United States leads the world in her output of copper, lead, and zinc, and ranks second to Mexico for silver.

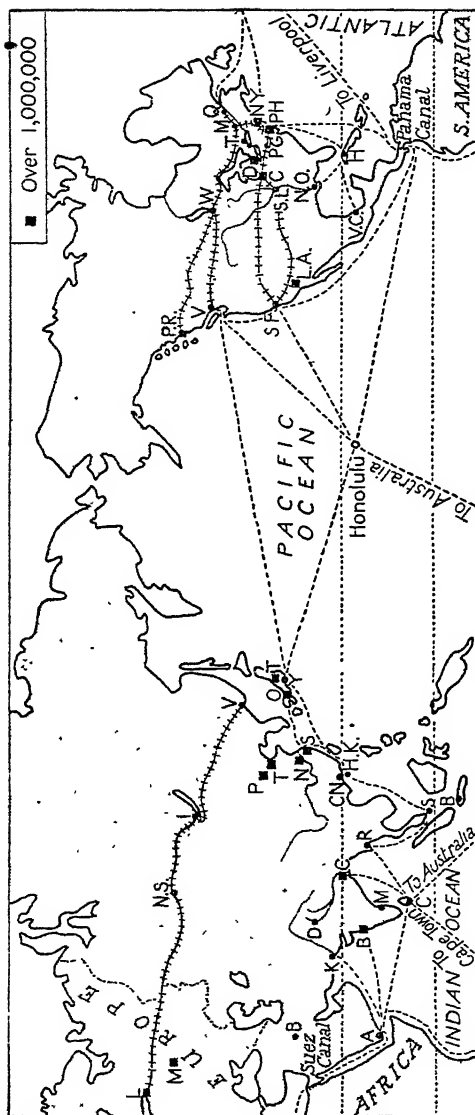


FIG. G. Transport Routes

Canada comes third in the list of silver-producing countries; second in those yielding gold; but first in the production of nickel, and also of radium, which has proved of such enormous benefit in the alleviation of suffering.

Transport and Trade

In scarcely any other respect is Asia so far behind North America as in transport facilities. There are few good roads, and most of the existing ones are mere tracks. Animals are mainly

used for carrying goods and for draught purposes, and in China, where man-power is cheap, coolies transport heavy loads often for hundreds of miles. In most parts of North America mechanical transport is employed both for agriculture and general purposes. Boats of various types, ranging from the ghufas of the Tigris to the sampans and junks of the Chinese rivers, are common on most Asiatic waterways; and streams, such as the Yangtze—the great highway of Central China—can be navigated by ocean-going steamers for hundreds of miles. But in the whole of Asia there is no inland waterway comparable in importance to the St. Lawrence–Great Lakes. However, with this exception, river and canal transport in North America has declined in recent years owing to rail and road competition.

Nothing has so retarded the development of Asia as the lack of railways, and the mileage is negligible compared with that of North America, where the United States and Canada have a greater length of track than all other countries combined. Half a dozen trans-continental railways traverse North America. In Asia only one—the Trans-Siberian—links west and east, though the Trans-Iranian Railway runs from the Caspian to the head of the Persian Gulf. In India, which has the best railway system in Asia, the lines have played a great part in the development of the country, and in fostering a spirit of unity among its diverse peoples.

As regards overseas trade, North America is better placed than Asia, for she faces the Pacific and the Atlantic, the two most important oceans in the world, and her east and west ports are linked by the Panama Canal, which is of great strategic and commercial importance. The countries of Western Europe provide a market for grain, cotton, petroleum, and other primary products, and in return sell high-quality manufactured goods to America. The United States finds an important outlet for her own manufactured goods in South America and Asia.

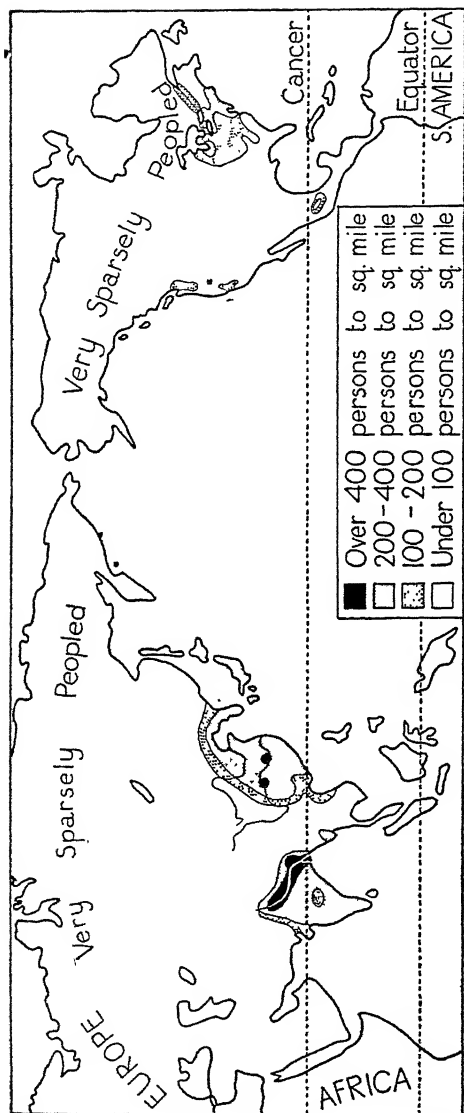


FIG. H. Distribution of Population

There is a considerable interchange between Asia and North America, on the one hand, and Europe on the other. Chief among Asia's exports to these continents are silk, tea, rubber, and tin. Imports include manufactured goods from both, as well as timber, cotton, and petroleum from North America. Britain holds the predominant place as regards Indian trade. The United States, Britain, and Japan are rivals in the Chinese market, but Japan, better placed than either of her competitors, has outstripped both the others.

Contrasting Civilizations

Few greater contrasts can be imagined than that between Asia, whose history goes back for several thousand years, and North America, whose history, to all intents and purposes, only commenced four centuries ago. No European races have made permanent homes in Asia, but North America, linked with Europe by the Atlantic, is inhabited mainly by people of European descent.

Three-quarters of the world's inhabitants live in Asia; little more than one-twelfth in North America. In Asia, where agriculture is the predominant occupation, the majority of the people have their homes in Monsoon Lands, where the heavy rains, coming during the warm part of the year, cause abundant crops, and so supply the simple needs of teeming populations, which in some regions exceed 2,000 to the square mile. The marked changes of season encourage foresight, for during the wet season Man from his surplus store must make provision for the succeeding dry and less-productive period. In North America the presence of coal has been one of the chief factors in the distribution of population, and the most densely peopled areas are found in the industrial regions of the North-Eastern States, and the adjacent area in Canada.

Climate, relief, and other geographical factors not only have a profound effect on the means of livelihood, but on the character of a people. The hard-working Chinese, the patient Eskimo, the stalwart Newfoundland fisherman, and the more leisurely cotton-planter in the Southern States are all products of their environment. But outside factors also enter into the question, and the people of both Asia and of North America have been greatly influenced by contact with Europeans, especially in the educational and industrial fields.

In no country have greater changes taken place than in Japan. As late as the middle of the

nineteenth century the Japanese were a feudal race, living in much the same way as the people of Europe did in the Middle Ages. Then they consented to admit foreigners, and within quite a short time changed the whole of their social system. Now they are one of the leading industrial, naval, and military powers, and so powerful have they become that they hold the dominant position in Eastern Asia.

But though vast changes have taken place in the East in recent decades, the average Asiatic remains conservative rather than progressive in outlook. He is frequently cultured, an artistic craftsman, and often a good organizer. On the other hand, the average Canadian or American is unrivalled in the common sense and insight with which inventions are applied in practice and developed on a large scale. Like Europeans, the American has a genius for co-operation, and thus has been able to develop great instruments of material progress, such as the steam-engine, electric power, and the internal combustion engine, all of which require close co-operation between scientists, engineers, industrial organizers, and business men.

The culture of both Asiatic and American peoples is based on deep-seated traditions, but in the case of the latter these traditions have been invigorated by the spirit of the pioneer. And it is this pioneer spirit, coupled with a favourable environment, which has enabled the virile people of Canada and the United States to develop those mental and physical powers by means of which they have made their continent the most progressive in the world.

EXERCISES

1. Compare the climate of Western Asia with that of Eastern North America and account for the differences.
2. Where is the most densely peopled region (i) in Asia, and (ii) in North America? In each case give *three* reasons which account for the density of the area you have named.
3. North America has better inland transport facilities than Asia. Give *four* reasons which help to account for this.